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## PAPERS READ

BEFORE THE

## ROYAL GEOGRAPHICAL SOCIETY.

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I.—*Report of an Expedition under the Surveyor-General, Mr. J. S. Roe, to the South-Eastward of Perth, in Western Australia, between the months of September, 1848, and February, 1849, to the Hon. the Colonial Secretary.*

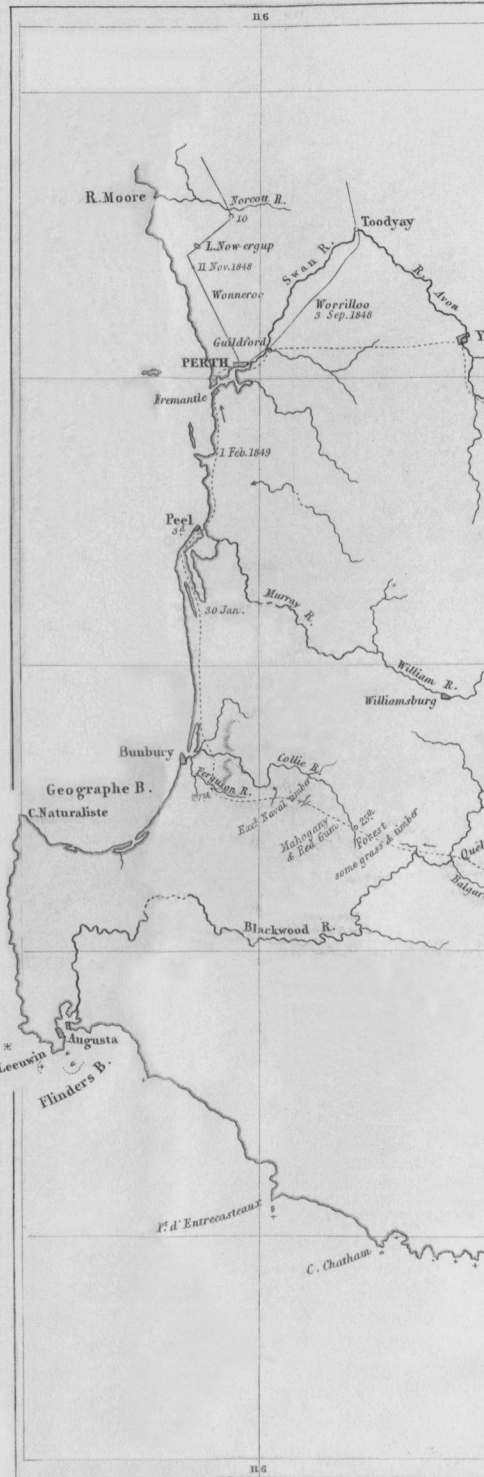
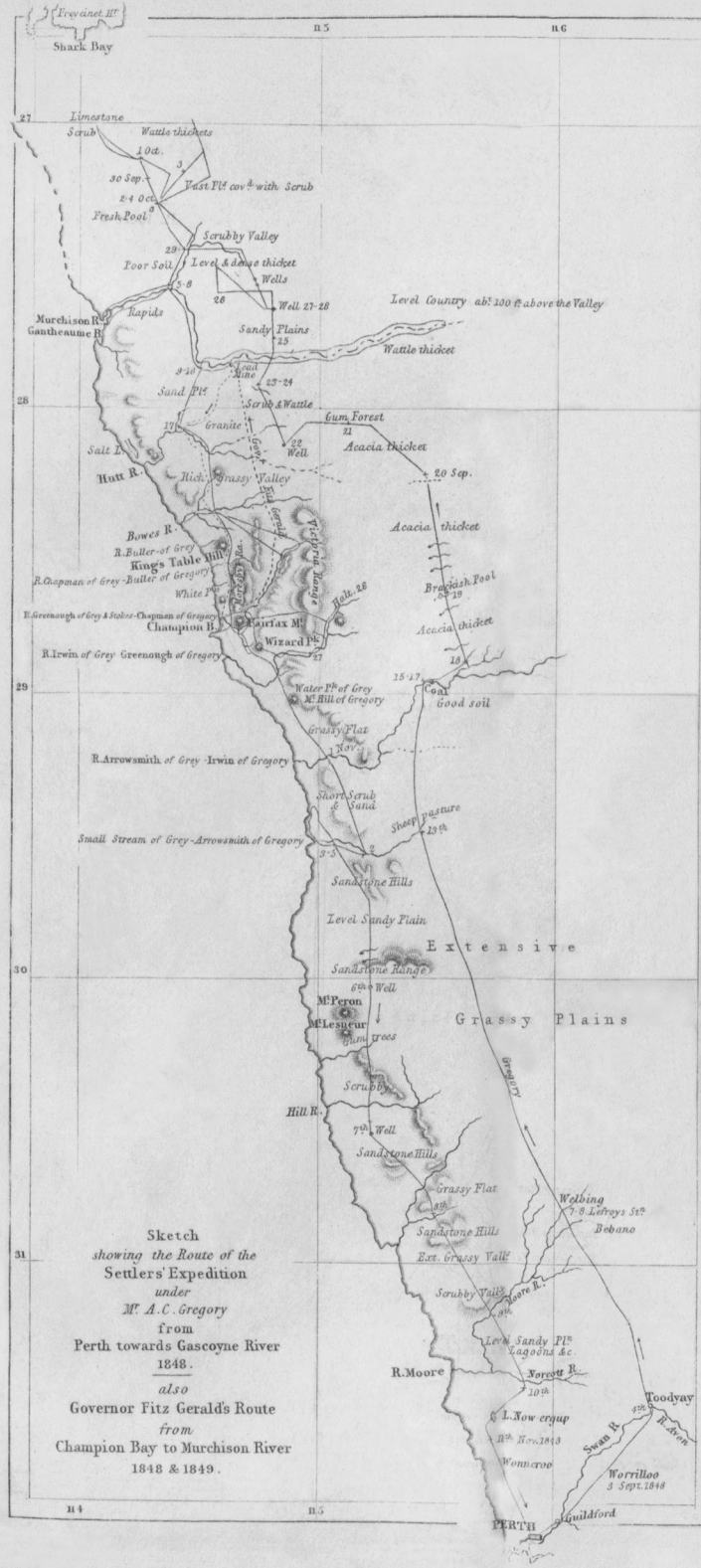
Communicated by the Colonial Office.

Read November 26, 1849.

Cape Riche, October 12, 1848.

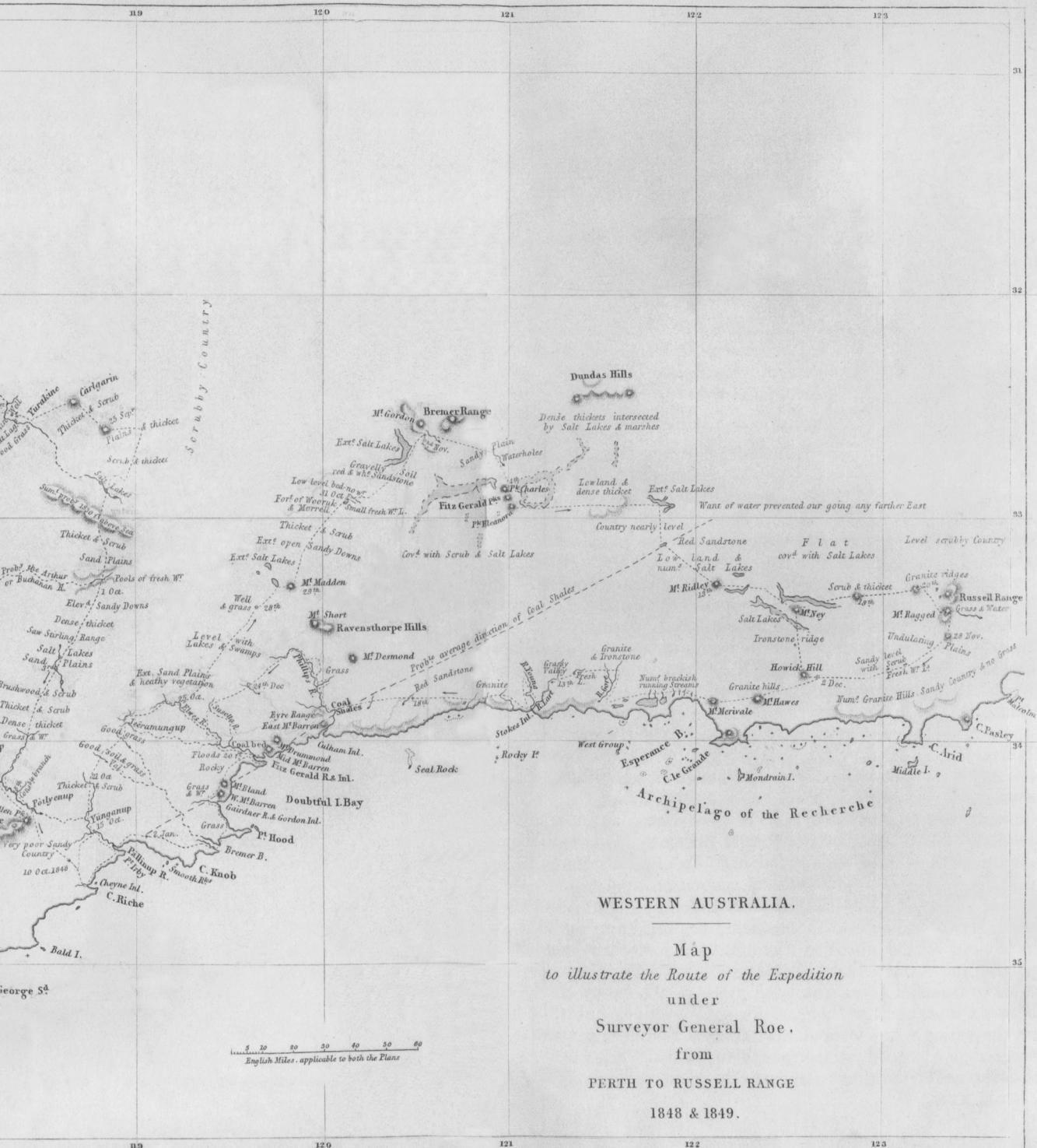
SIR,—I avail myself of an opportunity, *via* King George's Sound, to report to his Excellency the Governor my arrival here yesterday with the party, which he has been pleased to place under my guidance, and my intention to proceed to-morrow north-eastward, on the further prosecution of the service intrusted to me.

The expedition having started from York on the 14th ultimo, ascended the Avon river, and took its final departure on the 17th from Nālyaring, the upper sheep-station in that district, following the compass direction of E. by S.  $\frac{1}{2}$  S. as intermediate between tracts of country previously traversed. The rough plan of our route, which I have the honour to inclose, will show that in 15 miles we passed gradually from good grassy country about Nālyaring to scrubby sand-plains and eucalyptus thickets. At 34 miles we met with a tribe of natives who, although at first alarmed and suspicious, soon became friendly and useful, showing us several springs and wells of good water on our route, extending 50 miles to the boundary of their own immediate country. At this time we had descended from an elevated tract of sandy plains covered with low scrubby vegetation, and were threading a vast chain of small shallow salt lagoons, in a wide valley of thick scrub, several miles in extent, coming from the S.E., and extending in the opposite direction and westward, towards that part of the Avon a little above Jarakine Pool. The natives gave us to understand there was good grass in the valley of the river, between that pool and our camp at Yūrakine, but that higher up the valley was poor and worthless; I therefore quitted it, and proceeded eastward to the meridian of  $119^{\circ}$  E., where, finding that the country did not improve, and that we looked out to the









N.E. and S.E., over 15 or 20 miles of land apparently unfit for any useful purpose, or capable of affording subsistence for our horses, I turned to the S.S.W., towards the Stirling range, to accomplish the ultimate portion of my instructions before the dry season should become too far advanced.

At the end of 25 miles we recrossed the extensive system of salt lakes belonging to the Avon branch, already mentioned, and gradually ascended an extensive tract of elevated sand plains, which furnish the sources of the rivers Avon, Williams, Arthur, Buchanan, and Beaufort. The sharp, keen air of that region, and the difficulty we experienced in keeping ourselves warm, especially when exposed to the pelting hail, which was frequently brought along by a strong S.W. wind, induced me to conclude that our elevation above the sea-level could not be less than 1800 or 2000 feet.

Descending to the southward, through very thick country, or over scrubby sand plains, we forced our way across an intricate wide valley, in lat.  $33^{\circ} 16'$  S., in which were scattered small pools of fresh water, inclining westward, in a shallow clay bed, being probably near the source of the Buchanan river, the highest known portion of which was 80 miles distant, in the same latitude.

The country continued poor and unpromising, with some few exceptions, for 55 miles further, when we emerged from a very dense scrubby thicket, which we had found some difficulty in forcing, upon a system of waters falling into the S. coast, and were rejoiced and relieved at finding both water and grass for the supply of our half-famished horses. This proved to be a branch of the Pallinup river, which we followed downwards to our intended camp of Pöilyenup, near the N.E. extremity of the Stirling range, meeting with excellent grass and abundance of water in its valley. The weather had, indeed, set in boisterous and wet from the S.W., and rendered the country so exceedingly soft that it was with difficulty we proceeded.

The future route of the expedition must necessarily greatly depend upon circumstances; but as I learn that a branch of the Pallinup comes from the N.E. and joins the main river at 12 or 15 miles from its mouth, I have deemed it advisable to try the north-eastern country by that route as far as practicable, starting with supplies for 90 days.

Having now as briefly as possible detailed the principal occurrences connected with my past movements and future intentions, I can but regret that the former have proved of value chiefly in a geographical point of view, although much good and available country, both arable and pastoral, has been seen in patches adapted to limited operations; but I beg to assure his

Excellency that in the remainder of my proceedings, let them be in what direction they may, for carrying out the ultimate views of the Government, my best exertions shall be used for rendering the expedition as productive as possible of public benefit.

I am much indebted to Messrs. H. Gregory and Ridley for their valuable assistance, promptly and cheerfully rendered whenever necessary; and have great pleasure in reporting the uniformly steady good conduct of privates Lee and Buck,—the whole being animated by the best spirit.

Surveyor-General's Office, Perth, 10th March, 1849.

SIR,—I have the honour to report to his Excellency the Governor my return to head-quarters, on the 2nd ultimo, with the expedition under my charge, which left Perth on the 8th of September last, for the purpose of exploring the interior country as far as the Russell range, in accordance with instructions to that effect conveyed in your letter to me, dated the 30th of the previous month. Those instructions, I have the satisfaction to add, have been fully carried out. The expedition examined and passed round the range, and returned to Cape Riche, in 86 days, with the loss only of one horse, although more than once threatened with the loss of all by the dreadful nature of the country they had to force through on the eastern route. The nature of our proceedings will, however, be better understood by the following brief outline from my journal, and by the accompanying tracing of the route which the expedition followed. My letter of October 12th, from Cape Riche, will have made you acquainted with our movements up to that date. On the 14th of the same month, having rested those of our horses that required it, supplied ourselves with materials for light calico and dungaree tents, instead of the heavier ones we had brought from Perth, and discarded every article we could possibly dispense with, we took leave of our hospitable friends, Mr. and Mrs. Cheyne, and started from Cape Riche with 90 days' supplies for six persons, and 300lbs. of corn for the horses; the whole to be carried by our 11 horses, which were to complete their bait at the first well-grassed spot which appeared suited for the purpose. Such a place presented itself on the 15th at Yunganup on the Pallinup river, and we remained there until the morning of the 18th, completing our preparations. It is in latitude  $34^{\circ} 24' 6''$  S., 15 miles N. by E. from Mr. Cheyne's farm, and has a limited quantity of excellent grass in a small valley tributary to the Pallinup, which was here slightly brackish, in long deep pools, 80 or 90 yards across, abounding with black swans, ducks, and teal. While at the camp, a Cape Riche native, known as "Bob," who had engaged to form one of our party to the E., was visited by several of his

friends from Doubtful Island Bay, and other parts, including two who had walked with him from what he represented to be the neighbourhood of Middle Island; but as I could gather nothing more as to the nature of the interior country than Bob himself was able to communicate, I did not regret my inability to engage the proffered services of one of the two who offered to accompany me also, and who had previously accompanied Mr. Bland and Dr. von Sommer to the neighbourhood of Mount Barren.

Dispatching by them to Cape Riche our final letters for the Swan, with a suitable inducement to insure a safe delivery, we began on the evening of the 18th to ascend the Pällinup, in the hope and belief it would lead us to the N.E. In 7 miles we quitted the main river, coming in long open reaches from the westward, between grassy banks, and ascended a branch coming from the N.E., where we soon found ourselves amidst the white and red sandstone cliffs of the coal formation, and continued so for the next 6 miles, when we encamped just in time to escape the severity of heavy stormy weather, which set in from the N.W. with much rain. This continued and detained us in camp during next day, a respite which was to myself personally acceptable, as I had caught a violent cold by incautiously sleeping in wet clothes. Whilst ascending this river we carefully examined every accessible cliff for coal shales, but could discover no approach to them, the strata in this place being apparently too remote, and having no perceptible or decided dip in any direction.

Finding we were led too far N.W. by following up this branch, we quitted it on the 21st, 13 miles further N., coming from the N.N.W. through a valley of good soil and grass, 300 yards wide, with scrub on each side; the channel being filled with granite and whinstone, and the water high coloured, but brackish. Kangaroo and emu numerous.

Steering N.E., we crossed several small fresh streams running to the S., in good grassy valleys, and at noon, in lat.  $34^{\circ} 4' S.$ , came on one of large size, in a more considerable valley of good soil, well grassed. It was running from N.N.W., rather brackish, and, according to our native companion, flows into Bremer Bay, 45 miles to the S.E. I did not therefore follow it, leaving its further examination for my return W., should circumstances then permit.

We had now decidedly left all indications of the coal formation behind us, and were in a granite and quartz country of greater elevation, sheets of the former spreading out on the surface, and the latter blended with it. Pushing to the N.E. we crossed several fresh tributaries of the above river, occupying good grassy valleys, and encamped 10 miles further on, upon a N. branch of the same river, fresh, in a grassy valley of good brown soil,

timbered with yeit, casuarina, and wattles. The former is a species of the extensive eucalyptus family, with a dark rough netted bark, and is always welcomed by the traveller as growing in good soil, and amongst grass.

On passing over the first ridge on the following morning we were gladdened by the view of a large tract of good grassy country to the N.E., lightly timbered, and at this time well watered by a river and its numerous branches. It is known to the natives as Jeër-a-mung-up. Entering upon it immediately, we descended for  $2\frac{1}{2}$  miles by a well-grassed valley, with beautiful lightly-wooded hills or slopes on either hand, and then reached the main river, slightly brackish, in a granite rocky bed, and scarcely running to the S.E. Grasses of the best description filled its valley, and extended up the sides and over the tops of the gently rising hills on each side, which, as well as the valleys, were lightly wooded with yeit, casuarina, and black wattles. Finding from Bob that this stream flowed S.E. to the sea, near Middle Mount Barren, I left the lower part of it for future examination, and traced upwards to the N.E. by E. amongst rich grass and soil for 3 miles, when, finding the grassy breadth decrease, and the river coming from the N.N.W., I proceeded up a branch in a N.N.E. direction, and near the junction observed the latitude at noon to be  $33^{\circ} 54' 52''$  S. Samphire and rushes filled the bed of the stream, indicating a want of permanency in the good water. This being Sunday, we encamped at one o'clock for the remainder of the day, well satisfied at having seen between 12,000 and 15,000 acres of excellent grazing country during the late  $7\frac{1}{2}$  miles of our journey, with a prospect of its being much more extensive, especially downwards. Our native, who has crossed this river near its mouth, reports the land there to be good, which leaves room for a just inference that the intervening space of 35 or 40 miles may be the same.

On the 23rd, I followed this branch upwards to the E.N.E. for 4 miles further, when the grass and water had gradually diminished, so as to render its further examination of little importance, and I again steered N.E., a cloudy observation at noon giving the latitude about  $33^{\circ} 53\frac{1}{2}'$  S., and a high hill about Mount Barren, bearing N.  $104^{\circ}$  E., 45 or 50 miles distant. The country, as we proceeded, was poor and scrubby, with some exceptions, and we encamped late on a chain of salt and brackish pools, dipping E. in a country almost level.

Following these pools down next day, they soon joined a continuous river of brackish water, between banks of granite or sand 20 to 30 yards apart, coming from the N.N.W., and flowing E. and S.E. through open scrubby plains; joining the river of the 22nd many miles lower down, according to the information of our

native. The weather, which had been very threatening during the morning, drove us to an encampment earlier than usual, for after two hours' rain the country was scarcely passable for the horses.

Almost continuous rain from the S.E. quarter fell during the remainder of this day, and on the 25th, frequently bogging our horses in the hollow places while seeking their food. I did not therefore attempt to break up the camp until the following morning, when the wind had veered round to the S.W. and the rain ceased. We then resumed our N.E. route, passing over for the most part open sandy downs, or plains, separated by very dense thickets, through which the axe was in frequent requisition to clear a way for the horses. The country was high and level, water-courses had disappeared, and their place had been supplied by numerous small salt or samphire lagoons; upon one of the former of which we were obliged to encamp, with nothing but long coarse rushes for the horses, and brackish water, which oozed into our wells. Water was, however, speedily supplied in abundance by a most severe thunder-storm, which seemed to vent its whole fury in the very midst of our little party, the lightning darting through and amongst our tents in fearful flashes, and the frequent deafening thunder-claps threatening the destruction of everything around.

On the 27th the salt lakes and swamps increased in number and size as we proceeded N.E.; but after 4 miles they ceased, and our route lay up a long ascent to a country of much greater elevation, but of poor quality, covered with scrub and dense thickets, without timber. Thick showers following each other in rapid succession greatly confined our view, but the surrounding country for at least 2 or 3 miles appeared to be of the same description. While despairing of being able to feed our horses better than the night before we unexpectedly came on a small fresh lake, surrounded by good grass in a clump of trees, and gladly encamped there at once, having come upwards of 16 miles since the morning without seeing either grass or water, notwithstanding the rain, which had fallen nearly all day.

At 2 miles N.E. from our camp we were gratified at coming upon some good grass and a deposit of rain-water in a clump of yeit trees, and in observing the appearance of a small grassy granite hill to the N. of our route;—circumstances in themselves very trivial and unimportant in a general point of view, but to us all-important, as giving promise that their recurrence would afford us the means of sustaining our horses. We, however, encountered nothing but scrub and thicket for the next 14 miles, when we were again fortunate in discovering, amongst the many places examined, some good grass and a native well in a clump of yeit, where we immediately encamped.



By two stars on the meridian the latitude of this place was  $33^{\circ} 23' 6''$  S. I should gladly have set apart the next day (Sunday, 29th October) as a day of rest for many reasons, including that of drying our provisions, which had become very wet on their passage, during the last 3 or 4 days, through the rain and wet bushes; but independently of the small patch of good grass immediately round our camp having been all eaten close off, the weather continued too unsettled to hold out a prospect of my being able to accomplish the desired object effectually, I therefore moved on N.E. in the morning, and at the end of  $2\frac{1}{2}$  miles had an extensive view from the summit of a sandy plain of the country in advance between N. by W. and N.E. by E. We were, however, neither gratified nor encouraged by observing that, to the distance of 16 or 18 miles, which limited our view, the country appeared of the same description as that just passed over, the extensive undulating plains being occasionally diversified by dark lines of vegetation, probably only marking the thickets which separated them. At 2 miles further N.E. we came in sight of some extensive white sandy lakes 5 or 6 miles to the N.W., evidently salt, as also of a lofty red granite hill at the same distance, bearing N.  $80^{\circ}$  E. Despatching Messrs. Ridley and Gregory to ascertain the nature of the lakes, I conducted the party to the granite hill, which I had the pleasure to name Mount Madden, in compliment to my friend the Colonial Secretary of Western Australia, who had taken a warm interest in the expedition. On my way I passed several large granite sheets, with only short mossy grass about them, but abundance of rain-water collected in the cavities, and in some places forming small running streams, the result, probably, of the recent rains. A clear open lake, 3 miles in length, was left a mile to the N., soon after which we crossed over, with considerable difficulty, a broad wooded flat of 3 miles in width, evidently connected with its waters during very wet seasons, but now dry and much encumbered with dead trees and brushwood, both erect and prostrate. A long and very fatiguing ascent of  $1\frac{1}{2}$  mile, through close thickets or soft boggy land, brought us at length to the base of the granite mass, where our disappointment was great at finding only sufficient grass to give our horses a scanty feed during the night. Messrs. Ridley and Gregory rejoined us soon afterwards, having traced the salt lakes and their connecting channels downwards to the one I had passed near, and found the country about them scrubby and worthless. Ascending Mount Madden, we found it a mass of solid red granite,  $\frac{1}{2}$  mile in length, and from its summit caught a view of East Mount Barren, bearing N.  $172^{\circ} 15'$  E., nearly 50 miles distant, and again saw an intermediate range, apparently granite, which we had first observed in the evening. Its summit was now 15

miles distant in the S.E., and received the name of Mount Short in honour of the Bishop of South and Western Australia, who was expected at that time to be making his first pastoral visit to Perth. The country around our station did not present any very encouraging appearance, the principal objects visible being sand plains and thickets. The latitude of our camp was  $33^{\circ} 18' 14''$  S. On the 30th we pushed on to the N.E. 12 miles, over sand plains and through much close thicket, including the stubborn burnt sticks of last year 6 to 8 feet high, which much impeded our progress, and tore our clothes and packs. After searching many clumps of trees in vain, we at length found good rain-water and excellent grass among some burnt thicket, and encamped for the night.

Towards sunset of next day, after a fatiguing march of 23 miles through much thick country partially wooded, we were again greatly favoured by coming most opportunely to a small shallow lake, the water in which, although highly coloured by the clay bed, was quite fresh. A little grass being scattered along the margin, we encamped for the night. The latitude by two stars  $32^{\circ} 55' 20''$  S. On quitting this lake we entered immediately on a low level bed connected with it, and trending to the E., about 600 yards in width, its well-defined banks being evidently water-worn and flanked by thickets and dense scrub. Our hopes of a river were, however, disappointed, for at the end of 1 mile the unimportance of this channel was evident, and we quitted it, while it took a S.E. and S. direction towards some extensive salt lakes, which we afterwards saw within 20 miles of the spot. Red and white sandstone cliffs, 15 feet in height, were here seen and examined, but no dip or inclination could be perceived in them, nor did they again appear as we proceeded N.E. Our distance at this time of 80 miles from the sea-coast, with a very intricate country intervening, would have rendered coal itself of little value, had that mineral appeared.

On extricating ourselves from the thick country in this neighbourhood, and rising the open sand plains beyond, we obtained the first glimpse of a lofty bare granite peak 45 miles to the E., appearing over the intervening scrubby wooded land like the top of a huge sugar-loaf. A range of wooded hills of less elevation was also seen 25 miles in the N.E., and to them we first bent our way, as lying nearer our intended route; but the further we advanced the worse became the country, the scrubs and thickets were more dense, the sandy soil more stony, appearances of grass less promising, and after a fatiguing march of 18 miles, there was nothing better for our horses than coarse rushes and scrub, without water.

Early the next day, November 2nd, we proceeded in our N.E. course, and in 8 miles came upon an extensive series of salt lakes

and broad shallow channels, at least  $2\frac{1}{2}$  miles in width, studded with many low rushy islands, and winding towards the hills we had seen the day before in the N.E. On one of these islands I halted our hungry horses for  $\frac{1}{2}$  an hour, to give them the benefit of some grass there, which, although dry, was very acceptable, and we plied our spade in vain in the most likely places around for fresh water. All, however, was salt: the whole country for several miles seemed one extensive salt basin or low depressed plain, and to afford no chance of our finding in it the article we stood so much in need of. As the day advanced I quitted this salt region, and on keeping more E. came on good grass in several situations, but could not halt upon it for want of water,—our last chance was the range of hills for which we had been steering—one of those we accordingly ascended, passed several channels, quite dry, and were greatly disappointed on reaching the summit, after sunset, to find it a collection of loose quartz and whinstone, instead of granite sheets retaining water. Forcing our way at once towards a deep valley beyond, the darkness and almost impracticable thicket soon obliged us to halt, and we tied our horses up short in a small clear space, without a blade or drop of anything to give them. We were ourselves much better off, having a pint of water each, the last remains of our scanty stock. Markab, on the meridian, showed the latitude of this bivouac to be  $32^{\circ} 37' 11''$  S., or about 90 miles from the nearest part of the coast to the southward. Being now fairly within the range, we could perceive it consisted of a succession of steep narrow ridges of unequal elevation, covered densely with thickets and small timber, and yielding no grass. The soil was coloured a deep red by the ironstone at the surface, but the principal rock in view was whinstone, with fragments of quartz. This description seemed to apply to the whole of the range, which apparently extended N.W. and S.E. about 6 miles, with a width of about 3 or 4; but our view was very much confined by the thickness of the wood, and I had to regret being unable to catch even a slight glance at the country we had passed over, as the setting sun was gleaming like burnished gold upon some open water to the W. of our recent route, and would probably have pointed out an extensive continuation of the salt lakes we had encountered during the day. In remembrance of an excellent officer, under whom I had formerly served in the navy, I named this the Bremer Range, and its highest hill Mount Gordon.

Our horses having now been two days without water, and eating but sparingly for want of it, I became anxious to obtain a supply for them, and fortunately succeeded next morning by digging in a small water-course we had followed down to the eastward. Here their pressing thirst was in a slight degree alleviated by  $\frac{1}{2}$  a bucket

each of a red liquid, which was, nevertheless, fresh, and before the heat of the day came on we fortunately found an abundant supply of good water, in small pools in the midst of thickets and scrub, where little expected. The rush of the poor horses to it was so sudden and uncontrollable that they were all in the midst of the pool in an instant; and two of them carrying heavy loads were with difficulty unloaded and got out again. By this time we had passed to the S. side of the range, and found a continuation of the fresh pools in a water-course which descended from its south-eastern slopes; there was, however, a total absence of grass at this time, although there was reason to believe some good grass had covered the hill-sides previous to the last fires, which had swept all minor vegetation away, and left standing only that close thicket and scrub we heartily wished had shared the same fate.

Food for our half-famished horses being now the first consideration, and there appearing little prospect of obtaining it on a more northerly route, or of procuring fresh water in the great salt valley to the S., I steered E.S.E. across tolerably open sand-plains, towards the high granite peak we had seen on the 1st, which was 28 miles distant in the S.E. Anxiously did we watch the progress we made towards the desired haven, doubting not its being able to afford us the means of giving the party a couple of days' rest, of which all the horses were sadly in need. All our anxiety and exertions, however, could not accomplish our wishes; the famished and exhausted animals, after a fatiguing journey of nearly 24 miles to sunset, were unable to proceed any further up a continued ascent, and we were compelled once more to halt them for the night amidst coarse rushes and scrub, and without any water, their existence appearing to depend on our finding both water and grass on the morrow.

Algenib on the meridian gave the lat.  $32^{\circ} 52' 43''$  S., and our distance from the granite peak was still 3 long up-hill miles.

Commencing their ascent early next morning, the hill itself was eventually reached, but all search for the means of keeping our cattle alive was for a time fruitless. Both grass and water were, however, found on the northern side; and there the party encamped in the afternoon. I found it absolutely necessary to remain here a few days for the recovery of the horses, several of whom were so weak as to be scarcely able to stagger along with their loads, or to be got on their legs again after falling. This respite also enabled us to examine and dry the provisions and stores, repair saddlery and clothes, and put in order our saddlebags, which the recent thickets had almost reduced to shreds. A short rest was also acceptable to the whole party. This welcome retreat being at the most elevated and prominent

mass of land we had hitherto discovered on our journey, I named the whole the Fitzgerald Peaks, the highest being distinguished as Peak Charles, and another of proportionate elevation as Peak Eleanora. The former is about 1000 feet above the surrounding plains, and has some excellent grass on its eastern base. The view from this peak, although very extensive, was by no means cheering. In every direction lay spread out one vast sea of dark scrub and thicket, intersected by broad belts of salt lakes and samphire marshes, to the visible extent of 30 miles, and doubtless more, winding through a country apparently almost level; the only exceptions being the wooded range we had last quitted 35 miles to the N.W., and another range of similar appearance somewhat farther off in the N.E. quarter. To the latter I felt most desirous of proceeding next; but when I contemplated its apparent character through a telescope, and glanced over the intermediate country, a recollection that my horses had been 5 days without grass before they reached Peak Charles, forbade me to compromise their safety, and thereby to endanger the results of the expedition by making the attempt. Having therefore sufficiently recruited them all, with only one exception, and refitted our shattered equipments, we launched out once more on the morning of the 9th of November, into the frowning sea of scrub to the eastward, and soon came, as expected, upon country which had not belied its appearance.

It may be sufficient merely to add that, after struggling with this formidable country for 3 days, and by forced marches accomplishing a distance of 50 miles E. from Peak Charles, the expedition became almost entangled in a very extensive series of salt lakes and marshes, one false move amongst which would have proved its entire destruction. We had, however, fortunately come upon a patch of good grass for the horses in the midst of this universal waste, but they were sadly distressed for water, which had only once been met with since leaving Peak Charles. At this critical juncture it was found impossible to continue the exploration further eastward until they could be recruited. For this purpose, therefore, I began next day to work my way to the S., in hopes of speedily emerging from the extensive salt country in which we had hitherto encountered so many obstacles. No improvement, however, took place for the next  $12\frac{1}{2}$  miles, at the end of which we looked out upon a country of much less elevation to the southward, and with great thankfulness welcomed the sight of a considerable elevation to the S.E., which formed the only break in the uniformly level horizon. It is scarcely necessary to say that we instinctively turned towards this promising relief, but as I looked across the intervening distance of apparently 30 miles, and at the same time contemplated the distress and exhaustion of our cattle, I confess the

result appeared doubtful. We had not proceeded on our S.E. course more than 8 miles before the horse for which I had most cause to fear was knocked completely up, and unable to move another step. As he had only previously carried an empty saddle it was speedily removed to another, and to our great regret poor "Jack" was abandoned for the present, in the hope that we might yet find both water and grass within reasonable distance, and be able to recover him. Three miles further on, another of my best horses (Ney) also gave in, completely beat, and the rest were in a most pitiable condition, for we had been totally unable to restrain them from rushing into the salt lakes near which we passed, and from drinking part of their contents before discovering their briny quality. To avoid these lakes was impossible, the country being so thick that they were not seen until a few yards distant. As the sun was now near the horizon, and I was extremely unwilling to lose this second horse without some further effort for his recovery, the party were encamped on the spot, after a most trying day's journey of more than 23 miles, but once more without either grass or water. A kind Providence, however, which had already relieved us in many a difficulty, again interposed in our behalf, and by means of a light rain, which fell for 2 hours during the early part of the night, enabled us to collect with our tin plates, from the surrounding bushes, sufficient water to give the two weakest horses  $1\frac{1}{2}$  gallons each, and the remainder a quart a-piece. This proved most welcome and seasonable after having been 3 days and nights without a drop of anything but brine. We were also enabled to replenish our own small stock. This day we passed over, in lat.  $33^{\circ} 8' S.$ , long.  $121^{\circ} 52' E.$ , the dry beds of several salt lakes formed of the white and dark red sandstones belonging to the coal formation. They were very mottled and confusedly mixed, and had numerous veins of hard ironstone running through them, similar in appearance to the sandstone, which we afterwards saw in close connection with coal and shales.

Striking our light dungaree tents at 3 o'clock next morning (Nov. 13), we got away early on our S.E. route, the horses appearing somewhat revived; but their frequent falling and stumbling betrayed their extreme weakness, and at the end of 4 miles Ney, from utter inability to proceed, was again left behind. With many regrets he was here left, and we pushed on, the day becoming very warm and oppressive. Every obstacle was, however, finally overcome, and at 3 o'clock I had the satisfaction to encamp the party once more in a desirable spot, at the east end of the hill for which we had been steering, and to which I gave the name of Mount Ridley, after one of my companions, to whom I felt greatly indebted for his prompt and valuable aid on all occasions which required it. Indeed the whole party were actuated by the best



spirit, and I need not say it was fully taxed in meeting all their privations and difficulties. Next day Messrs. Ridley and Gregory, with the native Bob, brought Ney once more into camp, but in such an exhausted condition as to render another day's halt necessary for his partial recovery. I regretted this the more as the grass around Mount Ridley was scanty and poor, and I hoped to obtain it of much better quality at some other hills of similar character, which appeared at the distance of 25 to 40 miles further eastward. From the summit of the Mount, which is a huge mass of bare granite a quarter of a mile in length, and about 700 feet above the surrounding plains, several hills of similar description were visible to the southward and eastward, but in every other direction was spread out one illimitable sea of frowning scrub and thicket, with extensive chains of salt and samphire flats and lakes too numerous to particularise, and bounded by a distant horizon as unbroken as that of the sea itself.

Much of our time was now taken up in attending to the horses' backs and sides, which were sadly galled by their saddles. The leather and canvas of their appointments were also bad, and required constant repairs, which were rapidly consuming the small quantity of materials we had taken with us for the purpose.

Having, by the evening of the 15th, completed all pressing repairs, and weeded our baggage of every article that could possibly be dispensed with, we again pushed forward to the eastward early next morning, Ney with only an empty saddle. His powers of endurance had however been over estimated, for at the end of 15 miles they again failed, and he could move no further. Giving him a portion of the water we carried, Messrs. Ridley and Gregory's offer to remain and bring him on after us was accepted, and I made for the nearest granite hill, which was then 9 miles distant to the S.E., rising like all the others out of extensive level flats of salt lakes and thickets. With a star for our guide we groped our way after dark through the thick brushwood, and finally reached the hill at 9 o'clock, turning the tired horses loose to find the best feed they could. Water we had already passed through, in thick tea-tree swamps, nearly up to their knees, and next morning an excellent spring well was found at the eastern foot of the hill, amongst luxuriant grasses of the best description. Thither we immediately removed from the rocky unsheltered bivouac we had been compelled to take up for the previous night, and soon afterwards the absentees returned, having been unable to bring on Ney nearer than 4 miles: at noon the attempt was renewed, aided by our two water-kegs and a bag of good grass; but when night closed in the poor animal was still a quarter of a mile from the camp, utterly unable to move another step, and it was not until next morning that he could be brought in. As both grass and water

were abundant at this limited spot, I determined on leaving him here to have a chance of recovering from his exhaustion, and of being called for again on our return homewards by a more southerly route. I could scarcely bring myself to regret the delay of a day thus caused, as the horses were greatly benefited by being in such good quarters; numerous repairs were again made to our torn saddle-bags, and I was afforded an opportunity of obtaining an extensive round of angles to a numerous assemblage of distant granite hills which covered the horizon between E. and S.W. The most interesting of these to us was the Russell Range, which now for the first time came in sight 50 miles to the eastward, in lofty and rugged outline, cheering us with a far-off prospect of the eastern limit of the country I had been instructed to examine.

Although so near, however, there was no mistaking the nature of the intervening country, which was desolate and cheerless in the extreme, presenting no more friendly granite hills at which we could hope to keep our horses alive, and even the misty range itself caused many a doubt in my mind as to the nature of so huge a mass of rock, rising abruptly out of a sea of scrub. The whole northern horizon between this range and Mount Ridley was unbroken by a single hill, to the distance of 30 to 40 miles, and was covered with salt lakes and dense scrub on a gradual northerly ascent. Here, on the evening of the 17th, we viewed with peculiar interest, from our elevated position of 400 feet above the surrounding plains, a lengthened exhibition of the mysterious southern lights which, for more than an hour, darted or flashed upwards in rapid succession to the height of 20 degrees above the horizon, through a reddish glare, resembling the loom of a distant conflagration, but which was in all probability caused by the extreme haziness of the atmosphere.

The huge mass of granite, 200 feet above our camp, which had thus so opportunely afforded a refuge to our favourite horse, having been named after him Mount Ney, we suspended his saddle in a tree, and once more launched forth eastward into the formidable country before us, relying on a continuance of that aid and protection which had hitherto been so conspicuously extended towards us. Nor had we overrated the nature of the obstacles which now opposed our progress. At first we were flattered into hope by some relaxation in the density of the scrub, but as we persevered on our way towards a small granite hill where I hoped to obtain grass and water, numerous salt lakes again obtruded their unwelcome presence, bound and joined by thickets so close and densely matted together, as frequently to call our axes into requisition before the horses could move on. This belt of salt and scrub, 5 or 6 miles wide, which occupied the lowest part of a valley

trending to E. by S., being passed, and a passage forced through the close thickets which covered the opposite ascent, our poor horses could do no more, and were gladly conducted at the end of  $15\frac{1}{2}$  miles to their promised rest and feed. Here, however, not a blade of grass rewarded our minutest search, and only a few pints of water were lodged in holes in the rock. Some flags and coarse rushes occupied the place of better feed, and among these the horses were tethered to do their best, water being fortunately found by digging near the N.E. foot of the granite rock.

Quitting this inhospitable retreat as early as possible next morning (Nov. 19), we again steered E. through thicket and scrub growing in light soil, and at the end of  $6\frac{1}{2}$  miles came suddenly upon a small fire which had just been abandoned by some natives. The embers were under my feet before they were discovered, and the country was so thick that I did not immediately perceive near them several long bark baskets, tied up at the extremities, and filled with honey-flowers, which the natives had been employed in collecting. Their retreat was so hasty that they had even left behind two carved and well-greased "wommeras," used in discharging their spears, nor could they be induced, by the loud calls and invitations of our native, to return and give us an interview. We therefore placed some biscuit in their baskets, left everything as we found it, and proceeded on our way; Bob being of opinion that they either had taken us for devils and would never venture near the spot again, or that they were concealed at the time within very few yards of it. We had on several occasions reason to suppose that the natives were aware of our vicinity as we passed through the country, and were even watching our movements; but we saw none of them at this time, nor could we succeed on other occasions in bringing on any interview, although we purposely passed over tracts of country in which their fires were burning. On such occasions we saw footmarks on the sand of men, women, and children, though not of numerous tribes, and observed their signal smokes rise suddenly up within a mile and a half of us soon after we had passed.

Although the country still continued to be densely thicketed, it lost its generally flat character, and raised our hopes of a change,—for fresh water had lodged in no less than three places met with this day, showing the more clayey nature of the soil; the salt lakes seemed to have been left behind, and a gradual rise was perceptible in the undulations, which on their ridges had an outcrop of granite. A change for the worse appeared however in the scrubs, which became even more close than before, and contained considerable quantities of a broad-leaved stubborn eucalyptus, that would not readily yield a passage. At sunset we encamped once more without grass or water, but our hungry horses consumed the bark

off every tree, and the top off every bush within their reach, some of them even eating the dry sticks under their feet.

Early on the next day's march we were fortunate enough to fall in with a small pool of fresh water, and 6 miles further on our famished animals were revelling in a beautiful patch of excellent though somewhat dry grass, growing amongst yeit-trees in a circular flat 300 yards in diameter, having found nothing better than flags and rushes at the low granite hill for which we had been steering for the last 21 miles. We hailed this additional change in the features of the country with much satisfaction, good grass being invariably found amongst the yeit, in a better description of soil. Although the day was yet young I felt compelled to encamp here for the sake of the horses, several of whom had fallen during the morning from absolute weakness. From one of these, who had thus fallen, and had staked himself badly in his ineffectual struggles to rise, a rough piece of dead wood was extracted  $4\frac{1}{2}$  inches long and three-fourths of an inch in diameter.

Amongst the changes perceptible hereabouts we observed a greater variety than heretofore in the nature and qualities of the soil, which, from a general light sandy character amongst the salt lakes and samphire marshes, had now become more clayey and loamy, and altogether of a better description. It was also satisfactory to find we were traversing a country capable of retaining fresh water at its surface, for so little rain had fallen of late that we found the granite rocks were no longer to be so fully relied on as formerly for those supplies, which we had hitherto chiefly expected to procure from them. As we advanced eastward next day the country was found more undulating, and occasionally broken into large granite sheets, round one of which near our last camp was some good grass, but the general surface continued densely thick, and sorely tried our weary and exhausted animals, for whom I greatly wished to procure a few days' rest and good feed. At the end of 13 miles they could go no further, and I was compelled to halt them once more in the tall scrub, with nothing better than rushes, and without any water; nor did we prove successful in procuring any of the latter by digging. Climbing a granite ridge immediately over our camp, I looked out with much anxiety over the desolate space of not more than 20 miles, which still lay between us and Russell Range, and turned over in my mind a list, far too long, of those horses which I feared would never have strength to reach it. Granite hills were abundant to the southward, within the same distance, but I cared nothing for them at the time, and to the N. the interminable frowning scrubs presented an aspect anything but cheering. The only relief appeared in a small granite hill 16 long miles to the E., and as it was in the direction of our intended route, I launched out for it early next morning, relying

on a kind Providence, and the unsubdued spirit and energy of my little party, for aid. The poor horses staggered up to their saddles with a despondency and aspect which seemed to upbraid us with their treatment, and I felt glad to escape from the misgivings which their appearance created by commencing the toils of the journey. I should most gladly have reconnoitred in advance on such occasions, but in so fearful a country delays were utterly inadmissible, and to have halted the party would have been certain destruction to the whole. Thus were we hurried on from day to day, without its being possible to give the wearied horses that rest which was almost indispensable to their very existence.

Travelling now became difficult in the extreme. To avoid sapling thickets, 12 to 15 feet high, so closely packed that axes only could have opened a passage, we were compelled to take a more circuitous route round them, and to force a way through scrubs of a more yielding character. These were frequently so dense that at the distance of 3 or 4 feet no part of a horse could be seen, and the greatest care and watchfulness were necessary to keep them close together and in line. This work, however, could not last long; and when half way to the granite hill, four of the horses gave convincing proofs of their inability to proceed another mile, by streaming out in those profuse cold sweats which are always the forerunner of a complete and fatal break up. Thankful for the warning, the party was halted, the complaining horses unloaded, and arrangements immediately made for leaving behind everything that could possibly be dispensed with, including the whole of our salt meat, which had formed the entire load of one horse; but it was no easy matter to decide what in our situation could best be abandoned, our equipment being as light as possible, and without a single article that could in any view be deemed superfluous. Some little time was necessarily occupied in completing these arrangements; and our salt meat was about to be triced up to the trees destined to receive it, when the horses appeared so much revived by their short respite that I resolved to make one more trial to get on without the adoption of measures which might materially cripple the ultimate proceedings of the expedition. Distributing the loads, therefore, in proportion to the ability to carry weight, and every horse carrying a pack, we cheered them on as well as we could; kept them all moving and in close line; and late in the afternoon halted at the foot of the hill where we had hoped to obtain relief. Here, however, we again met with nothing but cruel disappointment,—not a blade of grass was to be found either over or around the hill; and a flattering appearance of water proved to be a mere trickling over a large bare granite sheet, scarcely sufficient to wet its surface. Encamping among some rushes and scrub at this spot, in the vain

hope of procuring water with our spade, the horses were suffered to roam about the hill, and pick up what they could find, while I climbed to its summit for a view of the surrounding country. Cheerless, indeed, was that view, and serious were the apprehensions forced upon me for the safety of the whole of the horses, in whose existence was likewise involved that of the party placed under my charge. At the distance of only four miles, the precipitous mass of rock composing the Russell Range rose abruptly, in a bare naked mass, to the height of 600 feet out of the surrounding scrubby plains, and not a blade of grass or the least appearance of fresh water was anywhere to be seen. Thickets and scrub, interspersed with sand-plains and salt-lakes, covered the face of the country, except where numerous granite hills disturbed the uniformity of the southern horizon, like so many bare rocky islands rising abruptly out of the sea. We had observed natives' smokes rising up about this spot from a distance, or I should now have left all our heaviest articles and hastened our dying horses on until I found both food and water for them; but not caring to run so great a risk of losing our provisions, and feeling that one false move in our critical situation would compromise the safety of the whole party, the last of the small quantity of water we had carried was shared out for breakfast; and early on the morning of the 23rd the party was moving on to ascertain the worst.

Making for the nearest part of the range, the bush became fortunately more open, and freely admitted the passage of our exhausted and desponding animals, who staggered along under their loads as if it were the last effort they could make. Our greatest present anxiety was to keep them from falling or lying down; as, when once down, they were with great difficulty got on their legs again. Finding, on a nearer approach to the range, that we had not been deceived as to its utter sterility on this side, we hastened towards a clump of yeit and casuarina trees at the S. end, and there, to our great joy, found abundance of excellent grass in a small thickly-wooded ravine, the bottom of which was occupied by a small rocky water-course. Here the party were immediately encamped: the horses required no bidding to feed after their long abstinence; and while one party was dispatched round the E. side of the range in search of water, another plied the spade in those spots giving most promise of it. Leaving one man to keep the camp, I then followed up the water-course in the ravine. This, however, proved most unprofitable; and after much scrambling and climbing was found to issue from a small deep cavern in the mountain, so defended by thicket and tangle as to be scarcely approachable. It was quite dry, and the spade produced lower down only a very small quantity of brackish



water, of a yellow colour. That water was somewhere in the neighbourhood there appeared little doubt, by several natives' fires having started up at little more than a mile from us; and we were discussing a plan for beating up their quarters when Lee and Bob returned from their excursion round the range with the joyful news that they had found a splendid run of excellent water near its N.E. extremity, with grass in the same neighbourhood. Reloading, we lost no time in proceeding to the spot; and I had once more the gratification of encamping in a situation where the horses could recruit their exhausted energies, and prepare for the remainder of their journey. No sight could have been more welcome to us at the moment than this beautiful run of pure cool fresh water, cascading down from the highest part of the range immediately above, and forming various lodgments in small clear pools, in which several of the poor horses immersed nearly their entire heads.

Although the feed hereabouts was neither first rate nor abundant, I felt it necessary to remain 4 days to recruit and refit, and had the satisfaction to find our stud improve rapidly in spirit, although not much in appearance. The rest was of most essential service, not only to their weary limbs but to their sore backs, in the constant attention to which neither time nor labour was spared.

Every effort was made to remedy the defects in our pony pack-saddles, to make them fit better; but we could effect little real good in this respect beyond fresh arranging their padding. Our saddle-bags were also in so dilapidated a state, that we were almost at our wits' ends for devising the means of making them hold together.

While these operations were in progress I lost no opportunity of collecting materials for my survey of the country, adding to the collections of geology, botany, &c., and making as many astronomical observations as our limited stay and the state of the heavens would permit.

The result of the latter showed that by four different stars a lofty flat-topped peak near the N.E. end of the range under which we had encamped was in latitude  $33^{\circ} 27' 15''$  S., and longitude by chart  $123^{\circ} 24'$  E.; the variation of the magnetic needle by means of 9 azimuths being  $2^{\circ} 46'$  W.

On ascending the peak this section of the range was found to consist of a sharp narrow ridge of rugged steep rocks, about  $1\frac{1}{2}$  miles in length, N. by E. and S. by W., with sides rising in many parts at an angle of less than  $45^{\circ}$  to the summit. Having seen no peak that better deserves the name, I conclude this to be the hill which Mr. Eyre, the discoverer of the Russell Range from the coast, called Mount Ragged. It is a somewhat loose mass of

laminated quartz and micaceous schist, dipping to the W. by N., at an angle of  $7^{\circ}$  or  $8^{\circ}$  from the vertical, and intersected by numerous quartz veins traversing the mount in various directions. The summit is about 600 feet above the base; and the latter 400 feet above the level of the surrounding limestone plains. Several remarkable transverse rents are also observable, extending from the summit to its base, and combining with other appearances to lead to a belief that the whole mass is rapidly breaking up. The other hills of this range are of similar aspect and composition, but are of less elevation, and lie in a detached group, 4 or 5 miles to the N.E.; the intermediate and surrounding country being covered as before with thickets and scrub, presenting a horizon 30 miles distant, in the N.E. and N.W. quarters unbroken by a single rise. In the opposite quarter appeared the mighty ocean, studded with many islands of the Recherche Archipelago, and numerous reefs, both covered and dry. The low sandy coast about Point Malcolm seemed to be not more than 15 miles distant in the S.E.; and numerous fires of the natives smoked up amongst its sand-hills, and along the coast farther to the N.E.; behind which rose some granite hills of considerable elevation, similar to those which now appeared in view behind Capes Pasley and Arid. Amongst them I directed my glass long and attentively, but in vain, in the hope of discovering some inducement for prolonging my journey to the eastward; for although I had then the satisfaction of standing upon the spot pointed out in my instructions as the eastern limit for present exploration, I should not have hesitated to exercise a discretion in proceeding farther E., had appearances and prospects in the least encouraged an advance. Such, however, was unfortunately not the case; not the least sign of a grassy tract of country appeared in any direction, and our horses had already had too much taken out of them to warrant my further risking their lives, by prolonging the examination of so fearful and impracticable a country. They had already traversed fully 1000 miles of country since leaving the Swan River, and had as much more in prospect before they could reach it again.

From this point, therefore, I determined on returning to Cape Riche by a more southerly route, for the purpose of intercepting and examining any rivers or streams that might fall into the S. coast.

On the 28th November, the horses having been sufficiently recruited, and all practicable repairs effected in our clothes and appointments, we commenced our return, passing from one to another of various hills composed of granite and gneiss, which we had noticed from the interior, and generally finding around them sufficient grass and water for our purposes. Grass trees and

zamiæ were again met with at less than 20 miles from the Russell Range, as also the Kangaroo, which afforded us a welcome relief from our long salt diet.

The soil of the country we now passed over was generally of a light sandy character; but it improved as we proceeded W., and encountered the novelty of numerous open fresh lakes, rushy lagoons, and abundance of fresh water, in a country lying low and level. Clumps of yeit trees scattered about it afforded our horses plenty of grass, and we had the satisfaction of seeing them improve daily in spirit and condition; for the country was more open and accessible, and gave us reason to hope all formidable scrubs had been left behind.

Fragments of limestone, of oolitic formation and variegated colours, were in many places abundantly scattered over the surface; and the same rock frequently formed the basis of the low rocky ridges which traversed the level country between the granite hills. The latter were usually bare, naked masses of close solid granite or gneiss, 300 to 500 feet above the surrounding plains, from which a sloping platform ascended for  $\frac{1}{2}$  mile to the base of the bare rock. These hills frequently presented the extraordinary appearance of deep yawning rents or fissures, 3 inches to 1 foot in width across their entire breadth, some being open, but the greater part filled up with loose stones and rubbish. The rock itself was too compact and solid to exhibit much dip or stratification; but wherever any such were observable, the dip seemed to be to the S.S.E., at an angle of  $20^\circ$  from the vertical. We found occasion also to observe more than once that the huge masses of rock, of which these hills were composed, had, from some unknown cause, probably subterranean, undergone a complete and violent disruption; and that whilst one end of a mountain mass would be piled up in a confused heap of immense boulders, its opposite extremity would repose in broad smooth sheets of almost unbroken rock. Whether such appearances have been occasioned by subterranean fire or merely exhibit the wreck of once lofty peaks, I feel unable to say; such hills had evidently in former ages been of considerably greater dimensions. Those met with on the eastern part of our journey could never be relied on for affording feed for our horses.

On the 2nd December, having reached a lofty and remarkable granite hill, 50 miles S.W. of the Russell Range, which I named Howick Hill, in reference to the nobleman at the head of colonial affairs, we were then 25 miles abreast of Mount Ney, and I determined on sending for our valued horse, if found alive and able to travel. Accordingly Messrs. Ridley and Gregory, who had volunteered their service, were dispatched to Mount Ney on the two best horses we had, while I conducted the party to

some grass and water which we had passed in a low swamp 3 miles back, the country for many miles round being tolerably level, and covered with very thick prickly scrub, knee high, closely matted, and difficult to get through. Large clumps of *nuytria floribunda* (cabbage-tree), mixed with *melaleuca* (tea-tree), both of stunted and gnarled growth, were now scattered about, and formed the nearest approach to timber we had seen for 350 miles. Stagnant water was plentiful, but grass very scarce, wiry, and coarse. The total failure of even this supply obliged me on the 4th to remove the horses to another and more grassy spot which we had discovered in our rambles, 2 miles farther to the S.W.; and I should gladly have moved the entire camp also, had I not feared our absent companions might thereby miss us altogether, had they travelled after dark to rejoin us. The necessity for shifting our camp was urgent; for, independent of the grass and feed being closely eaten off, one by one of our little water-holes had been dried up, leaving half a bushel of tadpoles, 1 inch long, at the bottom; and our bowels and limbs were affected by the unhealthy low situation. Intending to leave a notice of our position, we were preparing to start from this residence of fever and ague while we had the power to do so, when, to our great joy, the absentees returned late in the day, with Ney in company. His respite of 15 days had improved him wonderfully, though he still gave too abundant evidence of continued weakness; but this, I trusted, some indulgence would overcome. During our stay at the camp the weather was too cloudy to admit of my obtaining any astronomical observations beyond what enabled me to ascertain that the variation was only  $0^{\circ} 12'$  westerly. Mosquitoes and large biting flies were exceedingly abundant and troublesome.

On the 5th we gladly moved westward once more, the horses much recruited by the respite they had been afforded, and by the attention we had been enabled to bestow on their sore backs.

No material alteration took place in the face of the country. It continued nearly level, but with slight undulations of low limestone ridges, among which were many small fresh lakes, with occasional clumps of yeit, affording good grass and water.

On the 7th we were abreast of Esperance Bay, and encamped at the foot of a high granite hill, 15 miles N. from Cape-le-Grand, from the summit of which a crowd of lofty granite islands and rocks were observed to rise abruptly out of the sea, together with some covered rocks and reefs, which will render great caution necessary, on the part of the vessels frequenting the bay.

The shore of the latter is sandy for several miles back, and numerous lakes, apparently salt, were observed to lie behind its northern beach. Around our camp were many huts and recent

fire-places of the natives; and large smokes were curling up 3 or 4 miles to the westward, showing the country to be somewhat better peopled. This hill, being a very remarkable object at a distance of 40 miles, I named Mount Merivale, after one of the Under Secretaries of State for the Colonies; and a similar hill, 15 miles to the eastward, Mount Hawes. While taking a round of angles from the summit of the former, Mr. Ridley, who was breaking off samples of the rock, discovered in one of very white formation some remarkable veins and streaks of a light blue colour, which led to further examination, and to our quarrying to as great a depth as we could penetrate with the tools in our possession. All our sanguine hopes of copper, however, fell to the ground by finding, on our return to the camp, that the best specimens would not respond to the established tests.

To the W. of Mount Merivale we crossed several streams of brackish water, running in shallow channels, from 1 to 20 yards wide, towards the lakes behind Esperance Bay. These were the first watercourses we had met with for 400 miles; the surface-water of the country, where occurring at all, being found in holes amongst the granite rocks, in small rushy lagoons or open lakes, and occasionally in lodgments in the more clayey descriptions of soil amongst the thick scrub of the interior. In the latter situations were also frequently seen many circular spaces, 5 to 10 yards in diameter, in which the interior rain-waters had subsided, and which answered the description of Dr. Leichhardt's "melon-holes." From this time until we arrived abreast of the western group of the Recherche Archipelago, salt lakes were of frequent occurrence immediately behind the sea-coast hills, and yielded the only food for our horses which this part of the country was likely to afford us; nor was this at all abundant or easily found on the route I pursued. Mr. Eyre had, in 1841, generally found abundance both of water and grass hereabouts for his horses, immediately behind the coast hills; but I was desirous of avoiding all former tracks as much as possible, and, with respect to the nature of the country further inland, some natives we fell in with gave me to understand that nothing was to be met with there but scrub and salt lakes.

On the 10th we had, in search for grass, so worked our way amongst numerous salt and fresh lakes and swamps, and the narrow ridges of steep limestone hills which divided them, that it was not without some difficulty we extricated ourselves next day, and gained the less intricate country which bordered them on the N. The travelling was, however, bad, and very trying to our wearied horses, both on account of the steepness of the ridges, and their rocky rugged nature. We were, therefore, not sorry to find grass increase as we proceeded over more accessible slopes,

and that in one patch it was of excellent quality to the extent of 300 acres. Hopes being raised, toil no longer felt oppressive, and, before noon, we were once more gladdened by the sight of an open deep river, 15 yards wide, extending directly across our course. Clumps of nuytria and yeit were scattered about, zamia of gigantic size grew near the steep banks, and tolerable grass among dwarf grass trees extended back from 2 to 400 yards. Numerous ducks and black swans were constantly disturbed as we ascended the river in its course from the northward, but we found to our regret that the bed rapidly diminished in importance. At first the banks were frequently broken into steep yellow and red cliffs, indicating a proximity to the coal formation; but these gradually disappeared, and, in less than 3 miles, the narrow rocky bed was composed entirely of granite or gneiss, and the water in it was still brackish; the soil a light sandy loam. The day being warm and oppressive, with a land-wind from the N.W., and the thermometer at  $104^{\circ}$  in the coolest spot I could find, I took advantage of fresh water being found in the tributaries and swamps of this vicinity, and halted until 3 o'clock, amongst good grass in a clump of yeit trees. As we had expected, a thunderstorm began to brew in the N.W., which came on so rapidly that before we could secure ourselves in another camping place we had taken up for the night, it burst with great violence, and completely drenched us. Next day we traced this stream upwards to the total distance of 13 miles N.N.E., when, finding it took us so much to the eastward, and that the grass in its neighbourhood had considerably diminished in quantity, I left it coming from the N.E. in several branches, the valleys of which were narrow but grassy, and drained extensive elevated plains of poor and worthless character. Its mouth is near the spot where Captain Flinders records on his chart "there is a white streak in the sand-hills," and on its banks we occasionally observed some rich and very good soil. Kangaroo were abundant, and we frequently noticed traces of emu, but our only dog was so pitifully foot-sore as to be quite incapable of catching anything, nor could he be induced to keep on, even for ten minutes, the various leather boots we made for his relief. Naming this river the Gore, we quitted it about 16 miles from the coast, and crossed a western branch, as we steered westward over open scrubby downs, drained by small watercourses or lakes, containing either salt or brackish water. After a harassing march of 22 miles, we were fortunately enabled to encamp on the 12th amongst tolerable feed on the borders of a lake, perfectly fresh, and about three-fourths of a mile in diameter.

Five miles further westward over similar country brought us to the abrupt rocky banks of another river, with a samphire-bed 70



or 80 yards wide, in which were pools of salt water 20 yards by 6 or 7, but not a vestige of grass. As no inducement presented itself for following this river up to the N.N.E., I proceeded at once down to its bed to the southward, came soon to good grass where the banks opened out, and in less than 3 miles encamped in the midst of abundance of it and of drinkable water at the junction of several branches, some of which were observed to have cut their way through white, yellow, and red cliffs. While the horses took the benefit of their early halt, I minutely examined the cliffs and their vicinity, in company with Mr. Ridley; but although there was every appearance of their forming a portion of the carboniferous series, we could discover no shales nor any rocks in which could be traced a decided dip or inclination of the strata. In the evening the latitude by Menkar was found to be  $33^{\circ} 44' 8''$  S.

On the 14th of December we resumed our examination down the river, eagerly examining every accessible cliff we met, but discovering no shales. Granite or gneiss, with a large portion of hornblende in it, was in contact with these cliffs, and did not raise our immediate hopes of coal; nevertheless, at  $\frac{1}{2}$  a mile from the mouth of the river, a mass of dark red sandstone projected from its right bank into a deep navigable reach 70 yards across, and indicated a closer proximity to the object of our search. The water was here quite salt, and about 20 feet deep, tenanted by many fine large fish, resembling bream, upwards of a foot in length, which resisted the most tempting inducements we could hold out to them to take bait. Below this spot, the shores both of the river and of a fine large estuary which received it were low and sandy, and no more sandstone was seen to crop out upon them.

In less than a mile from the mouth of this river, our western course was arrested by the open deep reach of another, at least 250 yards across, coming from the northward, and flowing into the same estuary. Having ascertained that its mouth, which was  $\frac{1}{2}$  of a mile lower down, and divided into two open channels, was not fordable, I commenced its examination upwards. The low level banks soon rose to more undulating land, of light sandy character, clothed with some good grass, extending half a mile back, and growing among *nuytriæ*, gigantic *zamiæ*, yeit, tea-trees, *Jacksoniæ*, &c. In less than 3 miles the width of the open water had contracted to 100 yards, and a considerable peninsula, thickly covered with high grass, was projected by it to the eastward. Hereabouts several large grassy tributaries were added, and, a little higher up, a dry rocky ledge connecting the two banks obliquely, enabled us to cross to the right bank. The land on that side, however, was found to be so rocky and steep that we soon afterwards re-crossed, and finally encamped on one of

the above tributaries, at the first fresh-water hole we had found in connection with the river. Grass was here in ample sufficiency for our wants, and the river itself, which had now dwindled to a very brackish tea-tree brook, 5 yards across, wound its tortuous way through a well-grassed flat  $\frac{1}{4}$  to  $\frac{1}{2}$  a mile wide. Red cliffs occasionally broke out on the hill-sides thus far, and the land on either side of the river's valley had all the flat-topped appearance of the sandstone formation; but granite or gneiss was the prevailing rock on the lower levels, with occasional veins of quartz through it to the thickness of a foot. All our spare time was now directed to the horses' backs and feet, for the former required constant attention, especially to protect them from the flies, whilst many of their shoes were loose, and some cast altogether. To make good these defects in so rough a country as that we were in was most essential, but the practical knowledge of farriery amongst the whole party was only small; necessity proved, as usual, an excellent assistant in overcoming difficulties, and, without laming a single horse, Mr. Gregory soon became a practical farrier.

On essaying to follow up the river on the 15th, so many branches here fell in that it was not easy to decide on the principal one, but in such a case I deferred to the native's judgment, and kept to a valley coming from the N.N.W. At the end of a mile, a larger tributary than usual, containing considerable pools of open water, joined from the eastward, and appeared to me to be the main branch; for that which we followed to the N.N.W. soon diminished in importance, and ascended rapidly in a rough granite bed, between somewhat steep rocky banks. Although grass still covered the slopes of the narrow valley which contained the river, the latter was so much reduced in size and character that I deemed it no longer worth following, and at 10 miles from its mouth quitted it for the purpose of making a further examination of the estuary; and as that neighbourhood promised well for coal, I was desirous of ascertaining what facilities existed for its transport by water. Where I quitted this river it was coming from the N.W., and lay in irregular rocky pools, nearly salt. The stratified gneiss rock of dark glittering appearance, which here formed the basis of the country, was observed to lie in the direction of the magnetic meridian, with a decided dip to the eastward of about  $15^{\circ}$  from the vertical. Fragments of red sandstone, several inches square, lay on the surface near our rocky bridge, and contained many perfect impressions of bivalve shells. Crossing to the right bank by the rocky bridge, we came out on the estuary by some good grassy slopes near its mouth, passed close to an open salt lake which appeared to have some connection with it, across a very narrow dividing neck of land,

and then, proceeding westward, traversed open treeless plains  $\frac{1}{2}$  a mile behind the shore, covered with somewhat coarse grass, and drained by a small stream-bed, now in pools and slightly brackish.

The grass improved both in quantity and quality as we proceeded, but we met with no more water, and, after sunset, were obliged to encamp without it at the foot of a rough limestone hill, where grass was good and plentiful, with a few dead sticks for our bivouac fire. On ascending our little limestone hill next morning for angles, the estuary presented a fine open sheet of water at its foot, 5 or 6 miles long and 2 wide, with a general direction of S.E. by S. to its connexion with the sea. It did not appear very deep, and several rocky shoals could be detected with a glass under its surface: but for all purposes of boat navigation it seemed sufficiently open throughout its whole extent. Next morning I completed the examination of the estuary downwards, and found limestone to be the prevailing rock, rising in steep cliffs and abrupt projections. The mouth was closed by a dry sandbar 300 yards across, and 400 yards wide to the sea, which broke heavily upon two parallel ridges of sunken rocks close in front, thus preventing any permanent channel being open except for boats, and for them only in fine weather when the water outside is smooth. From the absence of shells inside the bar, it may reasonably be inferred that the sea never breaks into the estuary at any time, but closes up again any channel which its accumulated waters may occasionally force through the bar after heavy rains. The sea-coast was sandy, fronted by covered rocks and broken by rocky projections; and from a sand hillock at the estuary's mouth I set the Rocky Islets of Captain Flinders, bearing S.  $46^{\circ} 30'$  W., distant 20 miles. Naming this inlet after my friend Capt. J. Lort Stokes, R.N., and its upper river the "Lort," I called the principal river the "Young," after the Governor of South Australia. Tracks and fires of the natives were numerous in this vicinity, but none showed themselves, nor could I spare the time necessary for finding them out.

Returning to our camp, we proceeded on the same afternoon 11 miles westward, at first over limestone country, much broken into steep ravines, and then across undulating sandy land covered by low heathy vegetation. At sunset we encamped on an upper branch of another river, which had afforded us very bad travelling for the 3 previous miles through thick matted scrub and tall rushes. Broad open reaches were observed in its lower part 4 or 5 miles from the coast, but it afforded no grass whatever, and our bivouac was amongst burnt sticks and scrub, at a brackish pool 18 yards by 10, from which we disturbed some

ducks and their young families. The latitude by Menkar was  $33^{\circ} 49' 38''$  S.

Next day, December 17th, our westerly course led us 5 or 6 miles behind the sea coast, over poor country, the elevated ridges of which were chiefly granite or gneiss, with occasional red sandstone. Grass having been exceedingly scarce since leaving Stokes Inlet, we halted towards noon to give the horses the benefit of some good feed in a valley of yeit trees, through which wound the shallow bed of a stream, now in numerous fresh pools of excellent water 10 to 12 yards in diameter. Here our footsore dog contrived, with some difficulty, to kill a young kangaroo, and as we were not able to carry it, we dined, and in the afternoon again proceeded westward. Crossing over a high open ridge of sandy gravelly soil, we came at its foot to a salt watercourse, the banks of which were broken into soft red and yellow cliffs, amongst which were fragments of dark red sandstone. Nearly 2 miles beyond this commenced a broad flat of beautiful grassy land, dotted with yeit, wattles, and hakea, growing in good soil. At the end of a mile and a half we came to the watercourse which drains this plain; it was 8 yards wide, brackish, and winding to the S.W., at the S.E. foot of a steep cliffy bank. Here we halted for the night, and I observed the latitude  $33^{\circ} 49' 6''$  S.

From the summit of a long sandy ascent of 2 miles next morning, the rocky islets before mentioned were again seen bearing N.  $161^{\circ} 45'$  E., at the distance of 7 leagues; and the "Seal Rock" of Flinders was recognized through the haze, 9 or 10 leagues distant, bearing N.  $223^{\circ} 30'$  E. Some high breakers which had been seen on the 17th, about 3 miles off shore, were now again visible in a line with Seal Rock, and are thus mentioned because they are not noticed in the existing charts.

As the coast now seemed to take a decided turn to the W.S.W., and to be backed by sand-ridges and open downs of no inviting appearance, I maintained my westerly course for the purpose of striking a river which Bob said we should encounter on the E. side of East Mount Barren, and on which he reported some good grass was to be found. Soon after noon we obtained our first sight of the lofty hills of the above range, about 40 miles to the westward, but throughout the day passed over open country of very poor description and destitute of grass. No improvement taking place when the day closed in, we halted, under almost the only bushes visible, in a bleak open plain, which seemed scarcely to have a limit, and across which a strong S.E. wind did its best to extinguish the very scanty fire we found materials for making. The only cheering object in view was a watercourse 6 to 10 yards wide, in which water, as salt as brine, was winding very tortuously and slowly to the W.S.W., but its

banks and bed were composed of dark red sandstone, and the same encouraging rock had frequently been passed in the course of the day. The latitude of this inhospitable bivouac was found to be  $33^{\circ} 48' 26''$  S. Half a mile westward of it, East Mount Barren bore W.  $10^{\circ} 15'$  S., and a considerable hill, about 7 leagues distant, which I called Mount Desmond, W.  $28^{\circ}$  N.

Soon after noon of the 19th I gave our hungry horses the chance of picking up something amongst some low scrub in a small fresh swamp, and at the end of 14 miles made up all deficiencies by encamping them in good grass on a considerable stream, slightly brackish, and lying in pools 100 yards long by 15 or 20 yards wide.

The river here had a great and rapid fall among sheets and blocks of fine grey granite, which composed its entire bed and banks, with exception of occasional accumulations of a coarse quartzose pebbly sand, which had been carried down by freshes, and now lay in heaps 3 or 4 feet above the ordinary channel. The water in some of the holes in the rocks from 2 to 12 feet in diameter, was found to be perfectly fresh and good; whilst in others almost in contact with them it was far too brackish for use. The pools and holes were not full, and thin layers of salt, encrusted on the rocks, showed the gradual process of evaporation as the river had ceased to run. The fragments or *débris* on the banks (for in the actual bed of the river there were none) consisted chiefly of waterworn pieces of granite, quartz, whin, streak-stone, red sandstone, oolitic conglomerate, and a variety of fragments of a dark slaty colour, and very hard close grain. Calcareous rocks and red sandstone had repeatedly occurred during the day as we passed over a rough undulating country otherwise uninteresting.

On the 20th of December, as we advanced westward, the geological indications acquired additional interest in our eyes at every watercourse we crossed, for the intervening scrubby country showed nothing more remarkable than the occasional outcrop of red sandstone in a gravelly sandy soil. At  $3\frac{1}{2}$  miles from our last camp we crossed a river, in pools 100 yards by 20, and perfectly fresh, running slowly to the S.S.W., between banks which frequently broke into red and yellow sandstone cliffs. On examining these and the interesting *débris* at their feet, the prospects of coal being not very remote were greater and more encouraging, for we seemed to have got much lower in the carboniferous strata than in the stream-beds to the eastward. Flaky ironstone of a hard flinty texture was found at a low level, together with pebbly concretes, and layers of waterworn pebbles were also embedded in the cliffs. Amongst the *débris* of stones and gravel in the river's bed were fragments of slate, flint, and

apparent chalk, the same being also embedded in the rocky banks. From this spot the sharp-peaked summit of the lofty rocky range in advance bore W.  $10^{\circ}$  S., about 14 miles distant, and towards it we shaped our course, crossing three more streams of smaller size and fresh, running to the southward in grassy valleys, the developments in which made us long to linger on spots so geologically interesting: for in some of them the slaty coal-shales appeared, and were closely traced as far as visible.

The intervening ridges were high, steep, and rocky, and well covered with thicket and scrub, which appeared also to continue on the lower grounds, as these hills broke off into a descent  $\frac{1}{2}$  mile to the S.

The horses' feet now suffered so much from the extreme hardness of the rocks, which in many places required the greatest care in avoiding their sharp knife-like edges, that I did not regret when a valley, deeper and wider than the others, at length lay at our feet, and promised to afford them a respite on its well-grassed flats. Descending its steep and rugged slope, we encamped at 4 o'clock in the midst of luxuriant grass, in a valley  $\frac{1}{2}$  a mile wide, through which was winding, in a very tortuous course, the river which Bob had described to us as draining the eastern side of the range. Here the scenery was altogether rich and beautiful, such as, in contrast with our former scrubs and thickets, we seemed never tired of contemplating. It was, however, limited; and the effect was chiefly produced by the abutment into the rich grassy valley of several small projections from the higher land, composed entirely of fragments of red sandstone, quartz, and thin scales of micaceous slate, of every hue and colour. These projections and their intermediate little grassy ravines were beautifully studded with wattles and small ornamental trees; and above all rose a dense mass of dark green foliage, reminding us but too forcibly of the impenetrable thickets with which we had contended in the interior.

As the morning of this day had been wet and stormy, with much thunder and lightning from the S.E., and clouds were again piling up in heavy masses, threatening a continuance of the storm, I avoided all trees and conspicuous objects in selecting our camp; and fortunate it proved that I did so, as before the sun went down a thunder-storm, which had been gathering in the N.W., burst furiously upon us from the opposite quarter, and would have swept everything before it had we not been sheltered by a little thicket of saplings. This continued and even increased; and until early morning we seemed to be the sport of one continued dark thunderstorm, passing from S.E. to N.W., and *vice versâ*. The lightning gleamed and darted about us most vividly; and the sharp cracks of thunder seemed to be in our very presence, and to explode close by us. The rain did not fail to play its part either;

and by the time all was over our ammunition (in waterproof canisters) was the only article left dry, for our frail calico tents might as well have been struck at the outset.

At daylight nature smiled out upon us as if nothing had happened; and we proceeded on the labours of the day as soon as we could dry some clothes, and had looked about for the damage done by the elements; but excepting the leaping and brawling of the water-channels around, and the occasional grumbling of the distant thunder, no vestige appeared of the recent storm.

On examining the river 100 yards to the westward, it was found to be in deep open pools of considerable size, formed entirely out of a light-coloured greenish rock, laminated and stratified. Its lay was E. 30° N., and W. 30° S., with occasional deviations, amounting to 10° or 15°; and the dip was estimated at about 60° to S. 30° E. Thin veins of metamorphic ironstone traversed the strata, without any regard to order or arrangement; and to all appearance the whole of the adjacent range was of the same formation, its naked rocks being plainly visible to the eye.

Mr. Gregory, in following up the river's bed a few hundred yards, having found some loose pieces of micaceous slaty rock, apparently coloured black by a bituminous substance, and resembling a slaty coal, we proceeded on our examination of the river upwards with renewed hopes, and at a part of it  $\frac{3}{4}$  m. W. from the last bivouac, came upon shales of a promising character in the bed, of a deep slate colour, approaching to black, and apparently bituminous, with thin veins of still darker substance like coal between the layers. The direction and dip of the strata were as before stated; and the sides of the steep hills which rose from the river's bed were strewn with fragments of the same slaty appearance, but more hardened by exposure to the atmosphere.

The rains of the previous night had unfortunately filled all the lowest levels in the river's bed, and had also set it running, as well as every adjoining tributary. The bed was likewise so encumbered here with rocky fragments among the deep pools as to render our search difficult, tedious, and incomplete; for at the time it was in progress the horses were struggling and floundering across the rich grassy peninsula formed here by the right bank, where the land lay very low, and had been rendered soft and boggy by the rains; I therefore felt desirous of securing for them a firmer footing on the higher ground, and for this purpose cut off angles of the river which would otherwise have been more fully examined.

As we proceeded upwards, the obstacles and impediments near the river increased, and I found it necessary to withdraw the horses altogether from its vicinity, while in a condition to do so. While therefore Messrs. Gregory and Ridley traced its bed I conducted the party through the dense masses of thicket we had seen

from our camp, as the only means of getting above some steep rocky cliffs which occurred on the western side of them. By the time these were cleared, at the expense of much scratching and tearing, the party from the river's bed rejoined us, and reported that they had fallen in with coal shales, if not the actual coal itself, of far superior quality to that already noticed, and that it lay in large blocks in the river's bed. Not being aware of this till we had long passed the spot, I did not see it, but continued my search for some grass and a proper camping place, the horses being greatly fatigued with their harassing hill-work, and some of them very foot-sore.

Ascending a peaked rocky hill, 2 miles N. from the range, the river was observed to occupy a very steep rugged valley in the intermediate space, and to be in large pools. Above this it was observed to wind through extensive grassy slopes from the N.N.W. and N., its numerous tributaries being also well grassed, and the principal valley 15 or 18 miles off in the direction of N. by W. One of these tributaries, not so grassy as the others, seemed to cut its way almost wholly through a red sandstone country, and could be traced by its cliffs many miles to the W. and N.W. from its mouth, a little above the hill we were upon. Several lofty and abrupt hills of varied and peaked outline were observed between East and Middle Mounts Barren; and the latter itself appeared at the distance of 30 miles on the bearing S. 50° W. All these hills seemed to be composed of the same light-coloured micaceous slaty rock as that which formed the range near us.

Having given to the latter the name of Mr. Eyre, the indefatigable explorer who was the first to report its existence, we descended from our rugged elevation, and encamped 2 miles further to the westward, a little above the mouth of the tributary already noticed with the red cliffs. Here grass and water were abundant, and the rock chiefly red sandstone conglomerates, mixed with slate, and a variety of others in loose and promiscuous heaps.

At this camp we seemed to have got quite above or to the N.W. of the main coal seam of this river, which will in all probability be found to crop out in its bed between  $\frac{1}{2}$  mile and  $1\frac{1}{2}$  mile in a direct line above our bivouac of 20th December, from which East Mount Barren bore S. 28° 45' W. and the N. end of Eyre Range W.  $\frac{1}{2}$  S. I should even now have proceeded on foot for its further examination, but Bob assured me it was not the spot in which his friends had told him coal was to be found, and to which he was very desirous we should proceed without delay.

I have been thus particular in describing my passage across this coal-field, in order that others who may hereafter follow up the



discovery may be fully aware of what has been left incomplete. That coal exists in the locality pointed out there cannot remain the slightest doubt; for although the later specimens were so unfortunately lost, sufficient were seen and brought away from the neighbourhood to settle all doubts; and I have little fear but this valuable mineral will be found in considerable quantity where I have stated. Its locality is favourable, at 8 or 9 miles from the sea-coast, and probably 5 or 6 only from the head of an estuary which was seen at a distance to receive the river on the eastern side of East Mount Barren. This estuary (which was named Culham Inlet, and its river the Phillips) is probably navigable for boats for a few miles, but, like all the inlets on the coast, is doubtless shut up by a dry sand bar at its mouth, except during a small portion of the rainy season. This bar, and the anchorage off it, would be only 50 miles from the southern part of Doubtful Island Bay, where steamers might coal in security from a dépôt.

Being desirous of searching as soon as possible for the coal which our native had heard existed farther to the westward, and in a position so favourable as to admit of its being readily embarked in a boat, I proceeded previously to ascend the Phillips, and to examine the good country we had seen in its several valleys on the 21st. Here we found much good grassy land in the vicinity of the river, and of its numerous branches and tributaries, the greater number of which came from Mount Short and the Ravensthorpe Hills, and were mostly fresh, though sometimes brackish. Following that branch which led us most to the westward, at the end of 28 miles it had ceased to be worth following, and we proceeded S.W. over generally a poor country, but intersected by many small hollows and water-courses, containing good grass, and more or less water, mostly too brackish for use. The trap formation, through which the upper branches of the Phillips had been observed to flow, was now changed to granite, which showed itself extensively in the highest and lowest levels of an open country, without timber, and covered with low heathy vegetation, amongst which was much good feed for cattle.

On the eve of Christmas day I was enabled to give the party a long-promised rest, by reaching a well-grassed little tributary to a stream-bed in brackish pools, which was winding its way south-eastward towards the coast, in a bed of granite and trap. Here we brought forward our best for the enjoyment of Christmas in the bush, and dined off an unexceptionable roast saddle of kangaroo, followed up by a pudding, which Buck had manufactured out of soaked biscuit and sugar, and an allowance of brandy from the small stock we had carried as medicine. There was reason to believe that our repast was overlooked by a party of natives from the rising ground above, whose suppressed voices reached the acute

and practised ears of Bob, but whose presence could be nowhere discovered on our searching and calling out.

Numerous traces of emu and kangaroo were about our camp, as well as of horned cattle, but the latter were not recent. Of emus we saw but few as we passed through the country, but kangaroos were very numerous. The lat. of our camp was found to be  $33^{\circ} 45' 41''$  S.; but the cloudy, showery weather greatly interfered with observations of this kind, although otherwise welcome, as affording us a good supply of water among the rocks.

On the 26th, our journey S.W. was resumed with renewed spirits and energy; and at noon we felt that another important stage in it was performed by our gaining a misty, indistinct view of the Stirling range, about 80 miles to the W.S.W. We had then reached the system of waters belonging to the river on whose estuary our native supposed we should find surface coal, and observed increasing indications of its vicinity in red and yellow cliffs, and in the sandstones being in connexion with granite, a water-course in a deep valley alone separating them. Here we also saw West Mount Barren about 30 miles distant, bearing S.  $6^{\circ} 10'$  W., and a remarkable double-topped peaked hill to the eastward of it, which I called Mount Bland, bearing S.  $5^{\circ}$  E. Crossing the water-course last mentioned, in its rapid descent to S.W. by S. we found travelling difficult and rugged among numerous small rocky ravines, and finally steered to the southward to avoid them, and get upon more level land. At the end of 5 miles of level sandy country we came upon another branch of the river, winding to the southward in a very tortuous course, at the bottom of a rocky steep valley  $\frac{3}{4}$  of a mile wide. Here occurred the white, streaked, and coloured sandstones we had previously noticed on the Phillips, in close connexion with the coal, accompanied by the same ironstone veins, deep red sandstone, water-worn quartz pebbles, and rough coarse conglomerates, which had been observed to accompany them. Climbing over the edge of a perpendicular cliff, 150 feet high, overlooking the river in the bottom, caverns 8 feet deep were found to have been excavated by the atmosphere in the softer white sandstones, and the entire geological formation lay most beautifully before us.

The surface in this dangerous vicinity for our horses being extremely rugged and thick, I felt glad to remove them away southward as soon as possible, where the land seemed to descend, and to become more open as the distance from the river increased. At the end of  $2\frac{1}{2}$  miles we were again upon the verge of a similar sharp bend of the river, winding through a valley  $\frac{1}{2}$  to  $\frac{3}{4}$  of a mile wide, and bordered by broken red and white cliffs, 50 to 80 feet high, and in many places perpendicular. The whole country hereabouts was extremely rough, and thickly covered with scrub,

rendering the greatest caution necessary in threading our way slowly amongst the concealed rocks and holes. Descending to the river's bed by a low hill of granite protruding amongst the sandstones, we came there upon large pools of brackish water, and observed many indications of their being sometimes as high as 25 feet above their then level. Half a mile below this we encamped amongst good grass, in a rich flat, formed by the windings of the river, which then seemed to pass amongst numerous flat-topped ridges with narrow summits, sometimes bearing the appearance of perfectly level tables, and in other views assuming the form of sharp red peaks. Our native recognised this river as identical with that on which we were detained on the 25th of October by rainy weather and soft ground, about 15 miles to the N.W.

To abandon our search for coal at this most interesting period was not for a moment to be thought of, and we determined at all hazards to persevere in researches which now appeared so likely to be crowned with success. Choosing the smoothest way that could be found among the sharp rocks, we resumed our descent of the river on the 27th, watered the horses at a pool not quite so salt as those higher up, and in 2 miles from our camp passed the mouth of the main branch, coming from W. by N., in a valley  $\frac{1}{2}$  a mile wide, with steep cliffy banks. The river itself wound through an intermediate flat of grass and rushes, and was at this time running slowly between large pools; but the presence of samphire seemed to indicate that the water is not at all times fit for use. On the authority of our native, this main branch comes from Jeër-a-mung-up, where we had seen so much good country on the 22nd of October last, 30 miles to the W. by N., the whole of which space he also said was well grassed, and fit for good stock runs. Up to this time we had been in the geological formation, previously noticed, of granite on one side of the valley, and perpendicular sandstone cliffs from 50 to 100 feet high on the other. Half a mile lower down we passed the mouth of a steep cliffy valley, with a water-course in it coming from the N.; and being then on the high ground, observed the tracks of three horses and a pony, supposed to have belonged to our indefatigable botanist, Mr. James Drummond, who was known to have been recently in this part of the country prosecuting his favourite pursuit. Avoiding the cliffy bed of the river in this part for  $2\frac{1}{4}$  miles our travelling was improved, and we were then abreast of another steep valley from the N.,  $\frac{1}{2}$  a mile wide, and of the same sandstone formation as the others.

Taking again to the river's bed at this part, we were at length cheered by the sight of shales cropping out on its left bank, and in the bed found a small piece of undoubted coal. Halting the

party, further search was immediately made upwards, and all former toils and sufferings were amply rewarded *by the discovery of extensive beds of coal*, occupying the lowest levels in the channel of the river. The part exposed fully to view was 12 to 15 yards wide and 61 in length, N.N.E. and S.S.W., any further development being concealed by loose drift sand, covered with thick scrub, which occupied the whole valley except the immediate channel in use. Mr. Ridley afterwards found amongst this scrub another flat bed of even better-looking coal, 80 yards long and 6 wide, in contact with the lower end of the above;—and there is every reason to conclude that, on clearing away the drift sand and examining the beds of the deep pools hereabouts, the breadth of coal will be found much more extensive. It seemed to lie horizontally, without perceptible dip or inclination, but the adjoining shales which cropped out on the river's left bank showed a dip of 45 degrees to the S.E., and precisely resembled those which had previously been seen on the Phillips.

Diverting the small run of brackish water to a side channel, a pit was dug 5 feet long and 3 feet deep through the mass of coal, without observing any change whatever in its appearance, which was that of carbonized wood, resembling pine. The grain could be readily traced, and some of the pieces appeared even not to have been completely converted. Having been so long saturated with water it was exceedingly tough and compact, and until dried did not break with a brittle fracture. Elongated globules of bitumen, from the size of a pea to that of a goose egg, were found in it, as if endeavouring to force their way to the surface. As our mining tools consisted only of a spade and a tomahawk, and I was desirous of moving on while daylight favoured us, we did not penetrate more than 3 feet, but dried some of the upper and lower pieces, and put them through the test of burning. This proved most satisfactory,—they burnt with a good flame, and without the slightest crackling or flying,—emitted a regular coal smoke and strong odour, and left no residue but a soft white ash. The result was equally satisfactory when we submitted some of it to the process for gas, by means of a tobacco-pipe and some clay.

The river's bed was here 200 or 300 yards wide, between very steep banks, and was filled either with rank grass or dense thick scrub. Many marks of floods were visible to the height of at least 20 feet, which will render care necessary in selecting proper sites for shafts to work the coal. On the left bank, and in its small deep ravines, cropped out the shales in all that interesting variety we had observed on the Phillips, and their corresponding appearance tended more than ever to confirm the opinion we had formed, that we had been upon a bed of coal in the latter locality, and

that it would have appeared in view had not the river been set running by the rains of the previous night.

Having fully satisfied ourselves and feasted our eyes on the broad sheet before us, which was calculated to prove of such important benefit to the colony, we took away as much of the coal as could be conveniently carried on our jaded horses, and moved away to where Bob remembered to have drunk fresh water from a well amongst good feed for the horses. In 1 mile E. by N. we reached it, and were afforded another proof of the unerring memory and instinctive sagacity of the aboriginal native, in thus being able in so intricate a part of the country, almost totally unknown to him, to walk direct to a small water-hole, entirely concealed from view amongst tufts of grass. Plunging into the midst of these, our sable friend remained at least two minutes under ground, and then re-appeared with a distended stomach, and the welcome intelligence that plenty of good water existed 6 feet below the surface. Encamping immediately, under shelter of some neighbouring bushes, the spade was tried, and soon produced fresh water 2 feet below the surface, and therefore accessible to the horses, to whom and to all of us a little fresh water was quite a treat. These wells were in a grassy tributary to the coal river, the steep white banks of which were visible  $\frac{1}{4}$  of a mile below our camp. In the mean time Messrs. Ridley and Gregory had followed that river downwards a short distance, and reported that 1 mile below the coal the shales were still abundant, but apparently in some disorder, the dip being changed from S.E. to S.W., and occasionally to the S. They saw no more coal, and found that a very white appearance, which covered the entire right bank of the river below the coal-bed, was caused by numerous fragments of white quartz, which had apparently fallen from the surface of the land above, and had become partly embedded in the soft slaty and clayey shales. Menkar on the meridian gave the latitude of this camp  $34^{\circ} 1' 28''$  S., and abrupt red sandstone hills, flat-topped and peaked, rose up around it in every direction.

The inlet which receives this river being that on which our native had been informed a French whale-ship had procured coal for use, I determined on giving it a close inspection, and, with that view, recommenced our descent of the river on the morning of the 28th of December, keeping as near as possible to it in order to watch the indications. The river was here in pools, in an open valley  $\frac{1}{2}$  a mile wide, well supplied with spear, kangaroo, and other good grasses, growing among yelt trees and the māinung-wattle, both of which indicate a superior soil. At less than a mile from our camp a tributary joined from the right, opposite to an elevated quartz slope, almost a cliff, on the left

bank. The valley soon afterwards contracted to a width of 200 yards, and became cliffy and steep; shales again appeared in abundance on the left bank, crowned by a superincumbent mass of ironstone, but the intervening bed of the river would not afford a practicable passage by which we could get at them. They appeared, however, to dip as formerly,  $45^{\circ}$  to the S.E. The general direction of the river was here to S. by E.  $\frac{1}{2}$  E. for nearly 3 miles; its valley was narrow, and filled with slaty shales blending with quartz; all the water in its long pools was bad, and the banks were so contracted, precipitous, and rugged that it was frequently necessary to reconnoitre far ahead before we could venture to advance with our weary horses.

Two tributaries now fell in from the right within a short distance from each other, having a projecting grassy hill between them, and down a long reach of the river itself West Mount Barren appeared in sight, bearing S.  $13^{\circ} 30'$  W., at the distance of 16 miles; 2 miles below this the river cuts its way through a bed of shales, leaving them in perpendicular walls on each side 100 feet apart, and little less in height, with red sandstone above the shales and scrubby vegetation on the top of all. From the strong and decided echo among these singular cliffs, I called the place Glen Echo, and immediately below it had the satisfaction to observe the valley of the river open out and again become grassy. From N.E. at the Glen its direction changed to S.E.; well-grassed flats, 200 yards in width, occasionally occurred, and in a steep cliff of considerable elevation on the left bank, we thought the dip of the shales had increased from  $45^{\circ}$  to  $60^{\circ}$ , but could not afford to cross over for a more minute examination. Half a mile below this no shales appeared at the surface, but red sandstone took their place for 300 or 400 yards, and the white and yellow cliffs re-appeared with a dip not exceeding  $2^{\circ}$  to the S.E., and the river at their base. Here the country became much more open, good grass appeared along the valley of the river to the S.E. and E., and we appeared to be rapidly receding from all indications of the coal formation.

We here again fell in with some horse-tracks of Mr. Drummond, together with the remains of one of his encampments, but, from their appearance, we had little hope of falling in with that enterprising botanist himself except by accident. From the dip and open character of the country to the S.E. it was evident the estuary was not far off, and I therefore took up the best situation we could find, with good water and grass, where our exhausted cattle could recover a little while we effected its examination. This camp was on a chain of low swamps, filled with samphire and green rushes, in a broad flat valley which drained into the river about a mile lower down, and Middle Mount Barren bore from it

N.  $87^{\circ} \frac{1}{2}$  E., distant 7 or 8 miles. Traces of kangaroo were everywhere abundant, together with some of emu, and the bones of both were plentifully scattered around two large and very recent huts of natives near our camp, which seemed to have been occupied by them within the last two days, for the branches which had been used in their construction were still green and fresh. Like most of the huts or shelters we had seen scattered over several hundred miles of country, these were of very rude and primitive construction, having been formed by merely placing broken-off branches in a semicircle, and resting their broken ends in a strong forked support sloping towards them in front. The fire, which always forms part of a native's encampment, is invariably small and without flame, and is made within or without the support in front, according to the size of the hut, or to the number of persons it is intended to shelter. Near rivers or swamps which produce the tea-tree (*melaleuca*), its paper-like bark is used to cover in the huts, and is very loosely and carelessly thrown across straight sticks, stripped of their leaves, stuck in the ground, and arched over to a general interlocking at the top.

Having seen the camp established, and our horses feeding on the choicest spots of soft green grass which had been selected for them, I started with Messrs. Gregory and Ridley and the native, at four o'clock, mounted on the best of our stud, to reconnoitre the country in advance, and prepare for a more full examination of the estuary on the morrow. In less than 2 miles it came in view, about a mile to the E.S.E., presenting a fine sheet of open water, into which projected several prominent headlands promising well for deep navigation, but no opening could yet be seen to the sea. In the upper part it received some open reaches of our river, near which were also some open lakes, and farther eastward two of a sandy salt character, seemingly at this time quite dry. Beyond these we came out, at the end of a mile, upon the low swampy N.W. shore of the estuary abreast of the river's mouth, and worked our way S.E. to examine a lofty bold projection of yellow and reddish cliffs, which formed a prominent and not displeasing object on the estuary's northern shore, 3 or 4 miles further on. As we got into its neighbourhood the land became exceedingly rocky, broken, and rough; deep precipitous ravines, which would have required a long time to examine, were found deeply to indent the shore, and the projecting abutments between them were overhanging sandstone cliffs, washed by the waters of the estuary. Leaving Bob in charge of our horses, we scrambled and climbed about, examining all we could find accessible; but when the sun disappeared behind the opposite hills, the main headland was still  $\frac{3}{4}$  of a mile distant to the southward, and it would have been quite dark before we could reach it

across the thick scrub which crowned its summit. The mouth of the estuary being also observed to be about two miles distant in the S.E., and the flat summit of Middle Mount Barren bearing N.  $67^{\circ}$  E., at the distance of 3 miles, we remounted, and reached our camp soon after 8 o'clock.

Next morning (December 29th), with the same party, the examination of the estuary was resumed by passing round its opposite shore. Crossing the river  $\frac{1}{2}$  a mile S. by W. from our camp, it there occupied a straggling samphire-bed, nearly dry, and took a wide sweep round the margin of a rich flat with good kangaroo, spear, and other grasses. At the far side of this flat a tributary joined from the W. out of a steep cliffy valley, and the river itself became full between its banks, winding with rather a tortuous course to the S.E. Sandstone cliffs, 60 or 70 feet high, rose from its southern shore; in some places these cliffs and the mass of rubbish at their base approached so near the deep open river that we had scarcely room to pass, and could not avail ourselves of any occasional shallows in the river's bed on account of the softness of the light-blue clay which composed it. Hereabouts the dark red sandstone again made its appearance beneath those of lighter colour, but none of them had as yet any decided dip.

As we descended the river increased its open width to 100 yards, opposite to the mouth of a lake in connexion with its left bank, the whole of which shore is for several miles very low, sedgy, and at times under water. The depth is here, however, much diminished; both banks and bed are of clay and ironstone, with many sharp masses of the latter showing themselves above water where the broad wide mouth of the river joins the estuary. Remarking a low island which divides that mouth into two channels, we passed out on to the shore of the estuary, and found both the latter and the steep banks which rise up from it extremely rugged and thick. Low cliffs of red and white sandstone abutted on the shore, and the intervening spaces were covered thickly with a lining of stunted tea-trees and salt-water bushes, obliging us to wade into the treacherous estuary in order to pass them. Round the S. side of one very prominent projection, only  $\frac{3}{4}$  of a mile W.  $15^{\circ}$  N. from our steep headland of the preceding day, a cove,  $\frac{1}{2}$  a mile wide and deep, extended to the westward, and received at its head a small streambed, at this time dry, winding through a steep cliffy valley, grassy at its mouth. Red sandstone and a slaty shaly rock were here prevalent, together with an outcropping of laminated quartz.

The eastern side of the cove above-mentioned was formed of another steep red and yellow cliff, similar to that on the opposite shore. Its ridge was extremely rugged, steep, and thickly



scrubbed, and not finally surmounted without much scrambling and tearing; but all bruises and broken shins were soon forgotten when, at the seaward side of the cliff, *the same kind of shales lined the shore as those we had seen in the vicinity of the coal.* With raised hopes we proceeded, and contended against every obstacle, but, as usual in these close proximities to coal, the country was so rough and intricate that, notwithstanding our great eagerness to move on, the whole party were frequently hemmed up into the smallest possible space, without power to stir another foot until a new opening could be cleared. In our desire to avoid these formidable obstacles to our progress, and save time and distance as much as possible, we took advantage of every opportunity to wade in the estuary whenever circumstances permitted; but as the water was thick, and its depth not always apparent, our horses' legs were sometimes endangered by their plunging suddenly into deep holes amongst the sunken rocks. Such an accident threw one of them on his side, and caused some apprehension for his limbs, and even for his life, before he could be unloaded and got out again. The shales we here saw on an E.S.E. course of about a mile, were crossed by us obliquely as they rose out of the estuary, and lay in the general direction of between W. 20° S. and W. 27° S., with an uncertain amount of dip to the S.E. and S.E. by S. of about 45°. They then disappeared under the steep white sand-dunes of the sea-coast, which were covered thickly with flags and scrub. Below the shales the estuary contracted rapidly from 1½ miles to a width of 300 yards, and in some places even to 150 yards, and the depth of water in this narrow pass soon diminished to 3 or 4 feet, on a soft muddy bottom. A mile and a half from the shales, through much thick tangle, took us to the mouth of the estuary, which we found about ¼ of a mile wide, and choked up by a dry bar of fine white sand at least 300 yards across to the sea-rollers. From appearances within this bar, and from the general absence of marine shells on the shores of the estuary, it seemed likely that the sea seldom, if ever, broke into it, but rapidly closed up again any opening which occasionally might be made across the bar by the accumulation of water within after heavy rains. The small bay outside was sandy and apparently clear of rocks, but was somewhat shoal near the beach, and could afford no shelter to shipping from the strong S.E. winds of summer. From all northerly and S.W. winds it seemed perfectly secure, and boats would find the best landing at nearly all times where the high rocky shore commences at the S. end of the bay. The water is there smoother than in other parts of the bay more exposed to the S.E., and good landing might be secured by means of a very short jetty. From the bar Middle Mount Barren bore N. 47½° E., 3 miles distant.

Feeling disappointed that the surface coal (if any exists on this shore) should hitherto have eluded our observations, after the plain indications we had witnessed, I proceeded N.E. to search for any probable outcrop along the beach, and observed the sand dunes of the coast to be supported and partly formed by calcareous sandstone in horizontal layers or low cliffs, among which were many fragments of slaty shaly rocks. To seaward of these, appearances were in favour of fresh water being procurable in many places among the sand-hills at a very short distance below the surface, and at the end of a mile and a half a remarkable spring of excellent water was found trickling from the bare dunes at a considerable elevation above the beach. We found most tempting little pools of fresh-water in the pure sand amongst the limestone rocks and our native said that good water was always procurable here by scratching a small hole in the sand.

The surface now became strewed with many fragments of thin slaty rock, and at the end of a quarter of a mile I stood upon the summit of what had appeared from a distance to be a large bare sand-hill, but which in reality proved to be a mass of coal-shale, blended with a whitish schistose rock disposed in thin parallel plates. The whole was highly glazed over, by the influence probably of the sea air, and bristled up so sharply at an angle of 5 or 10 degrees from the vertical, that the hill was perfectly impassable for horses. The dip of the shales was here found to be curiously enough S.W. by S., which, combined with the great alteration also observed in the angle of its dip, proved that a very great geological change had taken place in the features of the country within the space of 2 short miles. I had visited the hill because it lay in the direction towards which the shales were tending from the southern shore of the estuary just left. A continuation of those shales I certainly met with, as expected, but showing so different an arrangement as to direction and dip, that I could only account on the spot for the sudden change by supposing that the Middle Mount Barren ranges had been thrust up from below at a period subsequent to that which formed the country around them. The flat-topped summit of the mount was distant only 1 mile to the N.E.  $\frac{3}{4}$  E., but in the bottom of that short space lay another inlet from the sea, with a dry sand-bar at its mouth, and two streams flowing into the head of it, which was less than 2 miles distant to the W.N.W.

As the sun was near the horizon by the time I had completed a round of angles from this bare hill, and we had yet much to do before reaching our camp, I moved on westward, and in  $2\frac{1}{4}$  miles came to a part of the larger inlet just below its very projecting cliffy headland.

Having from the opposite shore considered this spot worthy of

inspection, the horses were left in charge of Bob while we scrambled down the steep rocky bank to some low cliffs, and fully examined them and the adjoining shore up and down. The cliffs were of light-coloured hard sandstone and conglomerates, in massy horizontal layers, and the land in front was low, very swampy, and thickly covered with tea-trees. Although this spot was in the line the shales were taking from the opposite shore of the estuary, not the least appearance of any was here visible, nor anything further to indicate the near proximity to coal. As the day had now closed in we recovered our horses, and soon after dark reached the camp, though scarcely satisfied with the unproductive result of our harassing day's work.

That coal exists in the vicinity of the lower part of this estuary, although probably not at the surface, there seemed no reason to doubt, all its attendant clays, shales, and sandstones, ironstone veins, conglomerates, &c., having been there seen in abundance; but the great derangement which is observable in all the geological strata near the sea about Middle Mount Barren is calculated to throw out any but a practised geologist, and to lead to a belief that, if coal is discovered there at all by any other person, it will be by mere accident. It was gratifying to find that the estuary itself and the lower reaches of the river afforded good and open navigation for boats in a space of 5 or 6 miles to the bar, which was distant only 24 miles from sheltered anchorage in the southern part of Doubtful Island Bay, where, on the formation of a *dépôt*, steamers might lie convenient to the shore, and coal in security. Notwithstanding also the roughness of the 7 or 8 miles which intervened between the coal actually discovered and the head of navigation on its river, there is reason to believe a very good and tolerably level road may, without much difficulty, be carried between them, and probably between the coal-bed and the nearest bay of the sea coast to the S.E., distant about the same number of miles; but of the latter I have no means of speaking with any degree of certainty. With these facilities, aided by the projection of a strong pile jetty into the bay at the estuary's mouth, the inexhaustible bed of coal we discovered on the 27th of December may, at this particular juncture, be considered a most valuable acquisition to the colonial resources, and if worked and rendered available for the use of steamers, will have presented itself very opportunely on one of the intended lines of steam route.

These important considerations connected with the river on which we were encamped, joined with the large quantity of good country we had seen on its upper branches, induced me to name both the river and the inlet after Governor Fitzgerald; the small river on which we halted on the 26th, and which forms a pretty little tributary to the Fitzgerald, being called the Elwes.

Aldebaran on the meridian gave the latitude of our camp  $34^{\circ} 3' 26''$  S.

Being now in possession of the material facts that a broad seam of coal, if not several parallel seams, traversed this part of the country in an E.N.E. and W.S.W. direction, and that we had been very near to, if not actually upon, one of them, amongst the red sandstone lakes, noticed on the 12th of November, 160 miles to the E.N.E., I became very desirous of tracing these seams further in the opposite direction, where they might possibly be detected cropping out on some of the various stream-beds and inlets which fall into the south coast. I accordingly broke up the camp on the evening of the 30th, and proceeded from this interesting locality towards West Mount Barren, regretting that time did not admit of my making some further examination of Fitzgerald Inlet, amongst the precipitous rocky glens of which it seemed very probable that coal might even yet be found, near the surface, on further examination, with the assistance of a boat.

Proceeding S. from our camp of the 28th and 29th of December the Fitzgerald was crossed at our former ford at the end of three-fourths of a mile, and we then entered on an extensive level flat of excellent kangaroo grass, which had afforded our horses rich and abundant food. Beyond this we emerged from the valley of the river by ascending one of its tributaries coming from the westward, where the country was exceedingly rough, steep, and rocky, covered with coarse stunted scrub, and difficult of access. Further to the south it appeared even worse.

At the end of 5 miles we crossed over a poor sandy ridge at the source of this branch, and then crossed two others belonging to a different stream, which seemed to have its exit to the sea by a break in the coast hills 3 or 4 miles to the southward. The country around was extremely rocky, rugged, and scrubby. In the westernmost of these branches we crossed a briny salt stream, in pools, at foot of some well-defined yellow and brown sandstone cliffs, commencing 80 or 90 feet below the general surface of the country above. Salt was encrusted upon them, and had oozed out between the layers.

In 3 miles more over open gravelly sand plains covered with low heathy vegetation, we were passing 1 mile to the N.W. of the remarkable double-topped summit of Mount Bland, and both here and at the adjoining hill, West Mount Barren, observed a singular change in the character of the vegetation. Many plants and shrubs, long lost sight of, here reappeared under the protection of the hills. Mr. Drummond's new *Hakea Victoria* especially seemed to be perfectly at home in all its splendid magnificence; and we felt another stage had been accomplished in our journey by the reappearance of the "Müngart," or honey-bearing *Banksia*, so prized by the natives during its flowering season.

West Mount Barren being passed on its north side, we were descending from a shoulder about half a mile westward of its western base, when shales were again met with, lying as before W.  $25^{\circ}$  S., and *vice versâ*, and dipping S.E. at an angle of  $5^{\circ}$  or  $10^{\circ}$  from the vertical. They were extensive, and seemed to traverse the mount also through its whole extent, the neighbourhood being likewise strewn with quartz, ironstone, and all the conglomerates and rubbish heretofore observed to be associated with the shales.

The land continuing to dip as we proceeded S.W. along a small watercourse, with the shales occasionally visible at the surface, we came, at the end of 3 miles, to a very abrupt descent, almost amounting to a cliff, of red sandstone, overlooking a river at its base, winding to the S.E. Much good grass was in and about its bed, the main branch of which seemed to come from the S.W. and W., and to be joined immediately beneath us by a grassy tributary from the N.W. Descending carefully and without accident, I encamped amongst yeit and mǎinung wattle, at the fork formed by the tributary, and found the water in one of the large deep pools fit for use. Grass was in the greatest abundance and of the best description, fit at this time for making many tons of excellent hay; the kangaroo grass in particular being in its prime, with heavy seed-tops and young green shoots below.

This day's rough travelling again forced upon me the necessity for sparing the horses as much as possible in such a country, and indeed ourselves also; for not only were the shoes of the former lamentably on the decline, and their feet very sore, but some of the bipeds of our party were likewise nearly unshod, and neither nails, leather, nor tacks remained to effect any more repairs. It was therefore with some concern I learnt from our native that this river came through a very rough and rugged country; though the disagreeable information was somewhat qualified by the assurance that the good grassy land upon it extended only a short distance further upwards, and was then replaced by thick scrub. This changed my first intention of tracing it up, and induced me to proceed next day in the opposite direction, for the purpose chiefly of examining the river's estuary, the mouth of which I remembered to have passed some years ago on the western shore of Doubtful Island Bay.

Observing the latitude of our camp to be  $34^{\circ} 14' 5''$  S., and West Mount Barren to bear N.  $21^{\circ}$  E., 3 miles distant, we proceeded E.S.E. down the river in the morning; Messrs. Gregory and Ridley tracing the bed as far as the termination of the cliffs,  $\frac{1}{2}$  a mile lower down, with the chances of falling in with an outcrop of coal. None, however, appeared; and 1 mile further the estuary was seen, its mouth being about 4 miles distant to the E.

The natives call the country around this sheet of water Yör-de-lup, and the land about the Fitz-Gerald Inlet, Gnāng-meip. Our river now assumed a more bold and decided character, sweeping in fine open reaches 40 to 60 yards wide in the space of a mile, when it joined the estuary near a red cliff of considerable elevation on the left bank. The country around had nothing to recommend it; but the estuary appeared, through the trees which lined its southern shore, to be open, and navigable for boats. Several long points projected into it along its entire length of 3 miles, forming on either side deep bays or coves, in which were observed many ducks, teal, and black swans. From a dry sand-bar at the mouth of this estuary, Point Hood, which forms Doubtful Island Bay, bore S.E. by S., 4 or 5 leagues distant; and the sea-shore abreast was observed to be free of rocks, but without any headland or bay to afford shelter for boats or small craft. The anchorage in the southern part of Doubtful Island Bay being, however, only 9 or 10 miles distant, would always afford a ready and valuable resort for vessels, should this estuary ever be brought into requisition for the transport of coal by water.

Outside the bar the beach is very broad and level, and good fresh-water is procurable by scratching to the depth of a few inches in the little sandy hollows behind high-water margin.

Naming this inlet the Gordon, and its river the Gairdner, we quitted both and proceeded five miles along the beach to the S., where the travelling was good, and enabled us to avoid much rocky and rugged country. After crossing the dry sandy mouths of several small water-courses in pools, some fresh and others salt, which discharge themselves upon the western side of this bay, we quitted its sandy shore at the commencement of the granite formation, and proceeded 6 miles S.W., over very uneven grassy land, bare of timber, except clumps of tea-trees and peppermint in numerous small hollows, and abounding in kangaroos. This space would afford cattle or horses a good run, but is in some parts too much covered with low scrub to answer for sheep.

Coming out then on the shore of Bremer Bay, we made use of its soft sandy beach for 3 miles more, a heavy sea rolling in, with a strong southerly wind, and breaking high at the distance of 150 yards from the steep sandy beach. At 50 to 100 yards behind the shore, high sand dunes, scantily clothed with bushes, were partially supported by a long line of white cliffs of calcareous sandstone, which also abutted on the granite formed land at the northern end of the bay, but had there changed in colour to red and yellow. At the more sheltered southern corner of this long beach is the sandy barred mouth of another inlet from the sea, which I had on a former occasion ascended in a whale-boat to the distance of 10 or 12 miles, and was now desirous of further

examining by land. Crossing its dry bar, therefore, and considering in passing that the waters of the estuary were at least 5 feet above the level of the sea outside, we encamped after dark at a good spring-well of excellent water, a mile further up, in the midst of a small patch of rich luxuriant feed for our tired horses. The soil is good, and much mixed with marine shells. Red cliffs were visible on the northern shore, between 1 and 2 miles higher up; but the indications for coal since leaving the previous camp had been but few and remote, granite appearing to form the basis of the country along this portion of the coast, and the red sandstones to retire further inland.

Here we exchanged our limited congratulations on the succession of a new year. The 31st had been very cloudy and threatening, with light showers from the S.W. These increased after we encamped, and the old year 1848 went out with us exceedingly wet and boisterous.

*Jan. 1st, 1849.*—Proceeding, after breakfast, to the examination of this inlet upwards, in a westerly direction, we soon found the face of the country so rugged, and broken into precipitous rocky gullies and ravines, that to make any progress near its shore was a task of no easy accomplishment. Matters grew even worse as we proceeded, and at length finding that only detriment and loss of time ensued, and that our weary horses (who had lost 25 shoes amongst them) could scarcely be got along at all over the stony surface, I encamped about 5 miles from the mouth of the inlet, and next day proceeded S.W., towards more accessible country behind Cape Knob. In that neighbourhood, Bob (who might now be considered to have got again within the limit of his own immediate country) informed me, some wild cattle had long been roaming at large, and I felt desirous of ascertaining what had attracted them to the spot. In 7 or 8 miles we were upon their tracks, amongst numerous small rushy lagoons and swamps, in the midst of which were three small open lakes of good permanent water, which seemed to have been their particular resort. The tracks were very old, none of them having, to all appearance, been made within the preceding twelve months. It is, therefore, needless to say we saw none of the animals, the total number of whom we now learn did not exceed three. The lakes and lagoons, here alluded to, form part of an extensive chain, which occupies the lowest level in a wide valley formed by the northern slope of the sea-coast hills. These hills are of a limestone and sandy formation, and probably retain much of the drainage on its way to the sea, as fresh water is always to be found among the sand-hills of the sea-coast abreast, by scraping a small hole in the sand.

Before proceeding further westward I made one more visit to the neighbouring sea-coast, for the purpose of examining its

formation, being greatly prompted to this step by the alarming illness of one of our best pack-horses (Smiler), now stretched out on his side beyond our power of relief; for, in the first place, we could not decide with certainty what was the matter with him; and, in the second, we had no horse-medicines with us. Leaving him under the best treatment we could devise, we proceeded, mounted, to the beach as far eastward as the "Smooth Rocks" lying westward of Cape Knob. Here a steep granite head projected southward towards the rocks, and from its summit I observed a small dry rock, not laid down in any existing chart, about halfway between Smooth Rocks and the nearest trend of Cape Knob, or about  $2\frac{1}{2}$  miles from each. The sea appeared perfectly clear and deep all round it, and, from its lying low, and being apparently not larger than a large boat, would be dangerous to a vessel making free with the shore in the night. At this rocky head I had again an opportunity of observing the remarkable geological formation which had been so conspicuous in the northern part of Bremer Bay, and noticed that, while the head itself was composed of hard compact granite, it was overlaid on the western side by brown calcareous sandstone, adhering with the tenacity of a strong cement, and mixed with many petrified roots. Horizontal cliffs of the same kind of sandstone extended behind the beach eastward.

Returning W. along the beach it was found to be fronted by a ledge of flat rocks even with the water's edge, against which the sea broke heavily during a fresh S.E. wind, and created occasionally a smooth shelter within for boats. In this limited space of 20 to 60 yards wide, and 6 to 10 feet deep, shoals of fine salmon were swimming about, but would take no bait.

A little further W. the route lay across one of those extensive sheets of bare sand prevalent on all sea coasts, where the low white sand is kept so continually in motion by peculiar eddies of the prevailing winds, that vegetation fails in its struggles to maintain even a scanty existence upon them. Here the process was going forward in full force, and the sand-hillocks undergoing a rapid change of position by the force of a strong S.E. wind. The entire "sand patch" was in motion, and enveloped in a thick cloud of sand, moving along with as much facility as smoke, and gaining only fresh impetus by the perpendicular resistance it frequently encountered. To move at all amongst these animated sand-heaps with our loaded horses seemed at first a proceeding of rather doubtful issue, on account of fancied quicksands; but on Bob's assurance that it was a safe road, always used by the black fellows to avoid the adjoining rocky scrubby country, we advanced into it, and found the footing tolerably firm throughout its whole extent of 3 or 4 miles. In that space our route sometimes lay



over broad sheets of white limestone rock, of that peculiar oolitic formation which embraces the appearance of large roots of trees ; and amongst these rocks would occasionally appear one solitary plant or bush, struggling for existence against the overwhelming sands. Thus had evidently all the adjoining land been formed, and the process seemed in rapid continuation.

While traversing that part of this dreary waste which borders on the sea-coast, we came suddenly upon the skeleton of a human being, reposing upon a broad limestone sheet, about 200 yards behind the beach. Our native immediately explained that they were the remains of one of three seamen, who had quitted a Hobart Town whaler some 18 months ago, in the vicinity of Middle Island, for the purpose of walking into Albany, a distance fully 350 miles at the shortest. Why these men quitted, or were *suffered* to quit, their ship thus, on so inhospitable a coast, it is unnecessary here to remark on. The only survivor of the three, who was recently in the employ of Mr. Cheyne at Cape Riche, declared that they were landed with their own consent, supplied by the captain with as much provision as they chose to carry, and with a musket and ammunition ;—that, after a long ramble, they became much distressed for fresh water, and at length separated to search for it more inland, agreeing to rendezvous at a certain hill, then in sight in advance ;—but they never did so rejoin or see each other, and that he alone survived the fearful journey. The natives seemed to have been fully aware of the death of the other two, and ascribe it to actual starvation and exhaustion, disclaiming most strongly having used any personal violence, but, on the contrary, having endeavoured to assist the only one of them they saw before his death, who had, however, through fear or distrust, invariably pointed his gun at them when any one ventured to approach him. The unfortunate man now before us was said to be one of them,—the other lying somewhere amongst the sand-hills to the E., in a spot which our native did not profess to know. He was of rather short stature,—had on the remains of a coarse white shirt, blue serge shirt; and moleskin trousers ;—one blucher boot, with a foot in it, was detached a few yards, and the other lay near it, showing, with other evidences of severed limbs, that the body had been, after death, attacked by wild dogs. Two of these animals, of large size, were seen near the spot feeding on a piece of whale-flesh, and Mr. Gregory got a long rifle-shot at them, but they succeeded in getting clear off. Any attempt to describe the features or person of the unfortunate man before us would be perfectly useless, the face and hair having been totally destroyed, leaving the scalp still on the skull, and some parchment-looking skin stretched over the skeleton of the body. After ascertaining that no marks of personal violence

appeared on those parts of the head and body capable of showing any, the remains were collected and removed to a neighbouring hollow, where we built over them a pile of limestone rocks 6 feet long and 3 feet in height, with a large slab at the head, and left the poor fellow to repose near the spot where he had so miserably terminated his fatal journey. The heap will, doubtless, soon be covered by a hillock of sand, and become a collection of petrified bones. The position is about 3 miles N.N.W.  $\frac{1}{2}$  W. from the Smooth Rocks W. of Cape Knob.

The sun being now very low and the dreary "sand patch" yet to be traversed, we wended our way slowly onwards amongst its living hillocks, remarking on the sad spectacle we had just witnessed, having in all probability been occasioned chiefly by the want of water, which was anywhere to be had in abundance within a stone's throw, by scratching a small hole in the sand. This presence of fresh water in the large sand-drifts of the sea-coast has often been observed by travellers, but never satisfactorily accounted for, nor can I assign for it any cause more rational or probable than its being the drainage of the back country through those caverns and hollow ways which, in limestone countries, so much abound.

Passing through much good grass amongst peppermint trees and short steep sand hills, we reached our camp before it was quite dark, and I observed the latitude of the clump of large yeit trees in which it was situated to be  $34^{\circ} 24' 29''$  S., three miniature woods of the same description extending in a line from it to the N.N.W. about 1 mile apart. Our horse, Smiler, was somewhat better, but still gave cause for uneasiness.

Next day we proceeded W. along a beaten track of the natives, behind the sea-coast hills, where the land lay low, open, and for several miles nearly level, with small clumps of yeit trees and rushy lagoons. At the end of 10 miles we descended the steep shore of the estuary which receives the Pällinup river, and crossing its dry sand-bar, which was only 50 to 60 yards across, encamped 2 miles up its S. shore, where we found abundance of excellent grass, and tolerable water by digging near the shore of the estuary. The latter was at this time very full; the water in it nearly salt, and grass scarce on its lower part. Poor Smiler having been left behind on the opposite side of the bar, standing in the estuary up to his saddle-girths, unable to move another yard, Messrs. Gregory and Ridley brought him into camp late in the evening, somewhat revived by his refreshing halt. It was, nevertheless, but too evident that without further rest he would be quite unable to accomplish the remainder of his journey, or even to reach Mr. Cheyne's establishment at Cape Riche, although not more than 20 miles distant. I therefore availed myself of

this necessity for a halt to examine the Pallinup river upwards, as it was crossed hereabouts by the line of direction taken by the shales from the vicinity of West Mount Barren. About our camp the granitic stratified rocks preserved the corresponding direction of W.  $18^{\circ}$  to  $25^{\circ}$  S., and had a dip to S.  $25^{\circ}$  E. of about  $70^{\circ}$ ; besides which our hopes were further raised by observing an out-crop of red sandstone, with varieties of a lighter colour above it, and by a recollection that this was the river on which we had first noticed so many red and yellow cliffs about 12 miles higher up, on the 18th of November last.

With four of the best horses, therefore, the country was examined upwards one day and down the next, on which occasions some good grassy land was seen on the river, which swept in fine long reaches, broad, deep, and open for at least 8 miles above our camp, and showed occasional out-crops of white and red sandstone; but neither river nor estuary showed any coal shales on their southern bank, and the opposite shore was not accessible to us. Towards the lower part gneiss or stratified granite was the prevailing rock, in close connexion with white and red sandstone. Near the sea other sandstones appeared of a calcareous nature, overlaying the granite-gneiss rocks, and ranging in long horizontal strata, from 50 to 150 yards behind the beach. The hills on the eastern side of the bar are entirely composed of such rocks, covered over with loose sandy soil; but on the opposite side they speedily rise to granite hills of greater elevation, and terminate very abruptly to the eastward at Point Irby, or, as the sealers are in the habit of calling it, "Groper Bluff." This name has been applied by them in consequence of the locality being much resorted to by a large species of rock fish, weighing from 30lbs. to 100lbs., which they have named Groper, in consequence of its feeding among the rocks, and detaching from them large limpets, sea-ears, &c., with its stout long teeth, resembling those of a pig. We caught one weighing about 40lbs., and found it of a dingy black colour, short, sturdy, and very strong, with large black scales, and pointed head. It was well supplied with fins, and had soft protruding lips or gums, adapted to its peculiar mode of obtaining food. It proved excellent eating, very gelatinous and nourishing. Some wild ducks and duck-eggs were also added to our larder, the nests being found among the low bushes, from 100 to 300 yards back from the river's bank.

On the morning of the 7th January every surrounding object beyond 10 yards was completely obscured by the densest fog I have ever seen in Australia. Its appearance at that time was rather inopportune, as our poor horse Smiler was nowhere to be found, and we began to fear he might have stumbled into the estuary from weakness, and been drowned. He was at length dis-

covered lying down in a small thicket, and was brought into camp in a very weak state, notwithstanding his recent rest. Being nevertheless in hopes he would be able to accomplish the remainder of the journey to Cape Riche, now amounting only to 15 miles, we commenced, so soon as the sun had acquired sufficient power to dispel the fog, and proceeded up a steep rocky valley to the S.W. Passing northward of the high granite ridge which extends westward from Point Irby, at the end of  $2\frac{1}{2}$  miles the horses were watered at a permanent spring of good water, called Nōondeip, situate amongst granite rocks, in a water-course descending to the south-westward. A mile beyond this brought us out upon the scrubby coast hills overlooking a snug little boat harbour at their feet, from which the extremity of Cape Riche bore S.  $17^{\circ}$  W. It was formed by a low rocky point on its S. side: its sandy beach was open to easterly winds; and the sea broke heavily upon a detached covered reef, which lay to the southward of it, 1 mile from the shore. Passing up the steep rocky valley of a small water-course which fell into this little cove from the westward, the travelling was very rugged and bad for nearly 2 miles, when the beach at length became practicable, and our horses felt much relieved by getting on to it. After scrambling over two or three rocky sandstone cliffs which were lashed at their bases by a heavy surf, and crossing several small water-courses with beds of the same description, we at length reached the mouth of Cheyne's Inlet, and were surprised to find it open, with a salt stream 10 yards wide and 2 feet deep, running strongly out. Our approach having been observed, we were met here by the worthy owner of the property, Mr. George Cheyne, who showed us how to avoid some quicksands in crossing, and then welcomed us to his hospitable abode with his accustomed kindness and cordiality.

After an absence of 86 days, which, to our weak and worn-out horses in particular, had been a period of almost unrelenting toil and privation, they now once again revelled in the enjoyment of good corn and rest, and, with the exception of Smiler, rapidly recruited their exhausted energies.

Here we remained four days, during which the horses were reshod; saddles, bags, and clothes were repaired, and every preparation made for our return to the Swan, with provisions completed for 20 days. Every opportunity was taken of adding to my store of angles and other useful observations for my survey of the country; and for several hours on two successive days I watched from Cape Riche, and from the high land over it, for a covered reef of rocks which I was informed had been frequently seen by vessels 3 miles S.E. by S. from the cape. Although my vigils were both during and after a fresh breeze, when this danger might be supposed to be visible, I could perceive no appearance of it with a good tele-

scope, but have nevertheless no reason to doubt its existence. The latitude of Mr. Cheyne's large barn was  $34^{\circ} 36' 31''$  S.

As the water on the face of the country was now fast drying up, or becoming too salt for use, I hastened our preparations so as to have everything in readiness on the morning of the 7th January; but it was then found that our native had become tired of the service on which he had been engaged, and had gone to re-join his tribe. Finding it impossible to replace him without much loss of time, I had to abandon my intention of taking a new route to the westward, and through the middle of the Stirling Range, as all parties agreed in assuring me that fresh water was then extremely scarce along that line, and could only be found by the aid of a native.

On January 7th we took leave of our hospitable friends, Mr. and Mrs. Cheyne, to whom I felt greatly indebted for their kindness in facilitating all our arrangements; and leaving poor old "Smiler" to be recruited and forwarded on (as he was then so reduced as to be scarcely able to keep his legs), we proceeded along the beaten sandal-wood track on the eastern side of the Stirling Range, the remaining nine horses being much revived.

Encamping on the 9th at the spring of Pöilyenup, near the Pällinup river, we were there joined by four teams engaged in carting sandal-wood to Cape Riche, for shipment to China; and next day we proceeded up the river, passing through much good grassy country in its valley and various tributaries.

The branches of this river are numerous, and come chiefly from the eastward of N.; but as I wished to make for the military post at Kōjonup, we followed up what appeared to be the main stream coming from the N.W., and in 12 miles reached a place called Myerup, where Mr. Maxwell had a sandal-wood cutting station, at a good spring, and amongst fine grass. Here the beaten track terminated, and I could gain no information relative to water in the country in advance, but was fortunately enabled to engage a native to accompany us, and under his guidance followed up the river on the following day. The latitude of Myerup was found to be  $34^{\circ} 8' 57''$  S., with Ellen's Peak bearing S.  $21^{\circ} 15'$  E., and the Peak of Tōolbrunup S.W. by S.

Our next bivouac was at some large pools called Kybelup, 11 miles further on: the intermediate space being grassy in the river's bed, but scrubby on extensive open downs immediately behind the valley. Shortly above this we quitted the Pällinup, coming from the N.W. in a rocky granite bed, containing pools of water nearly fresh. The grass in the river's valley had by this time depreciated much, both in quantity and quality, and, as we proceeded westward, entirely disappeared in a level sandy country, covered with low scrub and brushwood. In  $7\frac{1}{2}$  miles

W. by S. from our last camp, we watered at Cārramup, a spring of good water surrounded by a small patch of grass, at this time very dry, growing in tolerably good soil. White gum and yeit were also now frequently met with, and at the end of 5 miles of grassy forest land, extensively fired by the natives, we encamped at a fine open lake of good water, 200 yards in diameter, called Tool-brun. Ducks were very plentiful about it, and the country around teemed with kangaroo and emu. Here we met the families or small tribe to which our native guide belonged, and by whom we were welcomed to their ground. These and all the aborigines we fell in with after leaving Cape Riche were afflicted with the prevailing whooping cough; they seemed, however, to adopt no precautions against it, and, on the other hand, the disease had visited them but mildly. Latitude  $34^{\circ} 6' 55''$  S.

Next day we travelled through mostly forest country, in plains well grassed, and had abundance of good water, camping at the end of 11 miles upon the Gordon River, in large pools of fresh water. Here again we had to repeat remonstrances at the day's march being so short, but all in vain: our guide (who richly deserved the appellation of "Donkey," by which he had been distinguished by the white people) persisted in saying the water in advance was all salt and bad. Latitude  $34^{\circ} 2' 34''$  S., and native name Kylobunup.

Throughout the 18th of January we travelled over grassy forest country, intersected by many small tributaries to the Gordon, in some of which were pools of fresh water, and in all of them good grass. Finding us resolved to proceed without them if they did not push on, our guides grumbled along at a somewhat better pace this day, and accomplished  $21\frac{1}{2}$  miles N.W. by N., halting at a small pool in a watercourse winding to the S.W. in latitude  $33^{\circ} 48' 2''$  S. They called the place Gnw-yillup.

On the 19th, being personally unwell, and quite unable either to walk or ride, I did not move away until 4 P.M., when we made a short stage of 5 miles, and soon after sunset reached a deserted sheep-station of Mr. Hassell's at Cūrralup, on the left bank of the Beaufort River. The grass here was extensive, and tolerably good; and the water of the river fresh, in large pools 30 yards across, winding to the N.W. A cart arrived soon afterwards to remove the contents of the hut, preparatory to Mr. Hassell transferring his principal station to the fine country we had discovered on the 22nd of October, at Jēer-a-mung-up, on the Fitz-Gerald. This arrival at the haunts of civilised man put us in possession of various particulars relative to passing events in the colony, and made us acquainted for the first time with the result of Mr. A. Gregory's recent expedition towards Shark's Bay—of his discovery of a lead-vein on the Murchison River—and of the Governor

having been wounded by a native, on a visit subsequently made to the spot.

Proceeding S.W. along a beaten road, next day, over undulating forest country covered with indifferent grass, at the end of 7 miles we crossed another branch of the Beaufort, in a soft dry bed 70 yards wide, filled with brushwood; and, in  $4\frac{1}{2}$  miles more, reached another of Mr. Hassell's sheep-stations, at a brackish spring called Wäkelup, or Joseph's Well. Here the overseer was preparing to remove his flock also to the Fitz-Gerald, the country around having been extensively burnt by the natives, and the grass nearly all destroyed for the season. In 4 miles N.N.W. from this station we reached Kōjonup barracks, and were met with every desire on the part of the small military party stationed there to render us any service in their power. By five stars on the meridian the mean latitude of the Kōjonup barracks was found to be  $33^{\circ} 49' 20''$  S.; and two azimuths gave the magnetic variation  $3^{\circ} 48'$  westerly.

Remaining at our camp on Sunday, the 21st of January, I performed Divine Service to our little party, according to the custom invariably followed throughout the journey whenever circumstances permitted; and next morning, having discharged our natives, we proceeded along the post-road towards Bunbury. The route lay amongst rocky forest-hills, and both grass and water were in sufficient quantities for supplying our wants; but, notwithstanding this, our horses continually cropped from many bushes on their way, and from none more eagerly than the poisonous plants which are so fatal to cattle and sheep. Our previous belief that horses could partake of these plants with impunity had now to be corrected; for, after crossing the Blackwood at 24 miles from Kōjonup, winding through a hilly country, nearly all of them showed such alarming symptoms of weakness and lethargy, that on the morning of the 24th I was glad to find a suitable place at which to halt them for the remainder of the day. They were fortunately somewhat relieved by the short respite this afforded them; but it was not without some difficulty that they were got on another stage of 16 miles next day, to a branch of the Collie River, at this time in fresh pools, in latitude  $33^{\circ} 34' 25''$  S.

At 12 miles from the Blackwood River the white gum and mahogany forests began to show some very good timber of the latter description, which increased both in quantity and quality as we proceeded N.W., improving as the white gum became replaced by red, and the trees grew closer, straighter, and better able to resist the pernicious effects of the periodical bush-fires.

On the 26th we passed about 20 miles N.W. by N. to latitude  $33^{\circ} 27' 39''$  S., through forests of the finest timber that could be

desired for naval and ordnance purposes; the splendid straight mahogany or jārrah trees, growing within 3 or 6 feet of each other, reaching to the height of 50 and 80 feet without a branch or blemish, and apparently quite sound. The red gum is equally perfect, although not so good for naval purposes as the jārrah, on account of its numerous gum veins, which would appear to weaken the timber in the solid mass, and to render it unfit for any purpose requiring the exclusion of water. It is nevertheless highly prized by the colonists for various purposes about a farm, and would apparently answer well for ships' beams, being of immense size, very hard, tough, and straight. It is, however, more subject to decay than the jārrah, which, in its sound state and free from sap, is not even assailable by those formidable and universal destroyers, the white ant and sea worm. The best timber is found in the most hilly country, and the greatest facilities are at command for the construction of roads through it, long straight timber of any required dimensions being on the spot for bridges and viaducts.

Eight or nine miles, on a devious course to N.N.W., through hilly country equally practicable, and equally well timbered, took us to the Ferguson; after crossing which, by a very good small bridge, the road became, and continued for  $3\frac{1}{2}$  miles, so steep and severe amongst sharp abrupt hills, as to be totally impracticable for a loaded team. After this, the country opened out and became more level, the hills were left entirely behind, and a good easy road might be made throughout the intervening distance to the shipping port of Bunbury.

Having now reached a located part of the colony, we passed by beaten tracks homewards for the benefit of our weary horses, and on the evening of the 2nd of February arrived at Perth, after an absence of 149 days.

During this period the expedition traversed nearly 1800 miles of country; and although, from the nature of the interior, no great addition has been made to the amount of good land available to the colony, much useful geographical knowledge has been acquired relative to a portion of this continent hitherto entirely unknown. Independent of all other considerations, and as being more immediately and practically beneficial to this colony, *the discovery which has been made on this occasion of coal in two available situations*, at this particular juncture, is alone a sufficient recompense for all the outlay and labour bestowed; especially if my anticipations are realised, that this valuable mineral may be traced even nearer than I found it to the anchorage in Doubtful Island Bay.

It is also to be hoped that, as one of the most valuable and most readily available sources of wealth in this colony, the superb naval timber which I observed in such inexhaustible quantity in the forests behind Bunbury, will not much longer be suffered to remain there



idle, but that, on the formation of practicable roads, the axe and saw will shortly resound amongst it, to the mutual advantage of the colony and of its parent country.

The pleasing duty now only remains to me of reporting my entire satisfaction with the praiseworthy conduct of Messrs. Gregory and Ridley, and of privates Lee and Buck of the 96th, who were associated with me on this expedition. To the cheerfulness and alacrity with which each and all were ever at their respective posts, putting forth their best energies and exertions to overcome formidable obstacles, and to further the objects in view, is mainly to be attributed, under Providence, my successful accomplishment of the duties pointed out in his Excellency's instructions; nor can I speak too highly of that spirit of steady endurance and determination with which they met unavoidable privations, and faced difficulties and impediments of no ordinary description, during our long and toilsome journey.

## II.—*The Settlers' Expedition to the Northward from Perth, under Mr. Assistant-Surveyor A. C. Gregory.*

WE could not do justice to the enterprise and exertions of the gentlemen who discovered the new tract of good land to the northward, in any other way than by giving Mr. Augustus Gregory's Journal entire:—

*Colonial Secretary's Office, Perth, Aug. 28, 1848.*

SIR,—I am directed by the Governor to inform you, that you have been appointed to direct the exploring expedition about to proceed northwards, on account of the zeal, energy, and enterprising spirit that have been exhibited by you on other occasions, and called into action with credit to yourself and advantage to the public interests. The party under your direction, it is intended, should proceed northward as high as the Gascoigne River.\* It is advisable to approach that river from the eastward, about 100 miles from the coast, after proceeding in a north-easterly and northerly direction from the country abreast of Champion Bay, it being desirable that part of your route which lies farthest in the interior country should be first accomplished, in order to avail yourself of the best chance of finding water.

You will examine that river as far as it may be practicable to do, with the view of tracing its course, of ascertaining, if possible, the nature of the bar at the mouth of it, and the question of its being practicable for boats, to what distance from the bar, and the nature of the soil in the vicinity of either bank.

After having examined thus the Gascoigne River, you will proceed in a southerly direction and examine the river, as yet unnamed, about 40 miles farther S., that flows into Shark's Bay, the mouth of which was seen by Captain Grey, and is placed by him at Point Long.

Should you proceed along the sea-shore for any distance, you will pay as much attention as your limited means will allow you to do to the peculiarities of the coast, and of any estuaries, creeks, or roadsteads that may present themselves.

You will bear in mind, that the primary object of this expedition is the examination of a new tract of unknown country for practical purposes, by practical men—

\* The Gascoigne River flows into Shark Bay, in latitude 24° 55' S.